The Electragist

TRADE MARK REG. U.S. PAT. OFFICE

Vol. 24, No. 6 — Association of Electragists INTERNATIONAL — APRIL, 1925

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NEW YORK CITY

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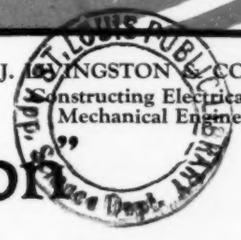

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A NEW RECEPTACLE

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STURDY CONSTRUCTION
EASY TO WIRE

This new receptacle No. L-7 is made in elephant gray ceramic. BUT the gray coloring matter goes right through the mixture so chippings can never show white. Moreover, the face of the receptacle is *black* glazed. Nine people out of ten take it for a composition receptacle. Mechanically similar to our famous composition receptacle, No. L-5.

***Shallowest* on the market. Large binding screws don't drop out.**

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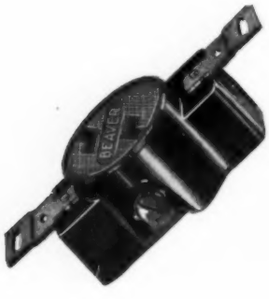

Cat. No. L-5

Cat. No. L-1

Cat. Nos. L-1 and L-2 are black composition with highly polished faces, shallow depressions around the slots to facilitate entering plugs. Truly handsome receptacles that we recommend for use with our bakelite wall plates for de luxe installations—at "budget cost"!

Cat. No. L-2

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A System that Checks Up Each Job at a Glance

SOME years ago Walter H. Taverner, president of the New York City electrical contracting corporation of that name, found that he was spending too much time trying to check up on each job his company had in work at the time. He was depending on the comparison of progress reports with estimates, of payroll lists with figures he had approximated in advance. His weekly check necessitated reading long rows of figures, of digesting their meaning and then of considering their relation to other figures.

Not only was this a time-devouring task when the company had as many as twenty large jobs under way, but it actually often led to incorrect or incomplete deductions concerning the progress of a job. In addition the preparation of the figures weekly often took a day or more of the bookkeeping department's time.

He realized that most of the effort he spent on the figures was devoted to extracting their meaning and the remainder to forming a judgment on the progress of the job. There were three operations he had to go through before he could think about how the job was going. He had to see, to think and then to retain and even after that neither he, his estimators nor his superintendent and foremen were getting an accurate picture of the job.

This was brought forcibly to him one day by a foreman whom he called in to talk to concerning the high weekly payroll on a certain job.

"The payroll is too high for the job," he commented.

"I don't see how it can be," the foreman replied.

Immediately after this he set to work to devise a system which would let him and his whole force *see* the condition of each job at a glance, and furthermore, a system which would indicate automatically whenever a job was approaching the danger point where profits left off and losses began. The result of his work was a graph system, two samples of which are illustrated here.

The cross sections of the graph may represent any predetermined amount. In Figure 1 the cross sections for labor costs represent $400, while those for materials are on a unit basis of $1,000. Four quantities are shown on the graph, viz: average weekly payroll, shown at the bottom by the dotted line; total payroll to date shown by the dot and dash; total material delivered to date, shown by the thin line; material on order to date, shown by the heavy vertical line at the left.

The total labor costs and total material costs are determined from the estimates at the beginning of the job and horizontal lines to represent these are placed at the proper height in the graph. The squares from left to right represent months. The length of these lines does not matter much but their termination at the right should indicate just about the time when it is estimated that the job will be completed. Any labor or material extras are then plotted above the original estimate total.

The record is by weeks on all of the quantities represented except for material on order. A week ends Wednesday night and the graph of every job in work is brought up to date by Thursday night.

Of greater value than anything else in the graph is the check it affords on labor costs. Material costs cannot be much changed, but labor costs can and as long as the line showing the payroll to date keeps a general direction which will bring it to a terminus beneath the horizontal line representing estimated labor, it is plain that the job is progressing satisfactorily. If, however, the line assumes a direction too nearly vertical and one which will bring it out to the left of the estimated labor line, investigation and correction of the cause is automatically recommended.

The line at the bottom of the graph showing the weekly payroll will also indicate this when it shoots to a peak unreasonably higher than it should be.

A spirit of cooperation and enthusiasm among his estimators and his foremen and on the part of his superintendent, according to Mr. Taverner, has been the most pleasing by-product of his graph system. The whole organization watches the graphs as closely as he does and the minute anything wrong shows up everyone is working to correct it.

When conditions on a certain job make it impossible to keep down labor costs, as happened on the job shown in Figure 2, the graph at least shows just what caused the loss and enables the company to guard against a second loss from that source. In the

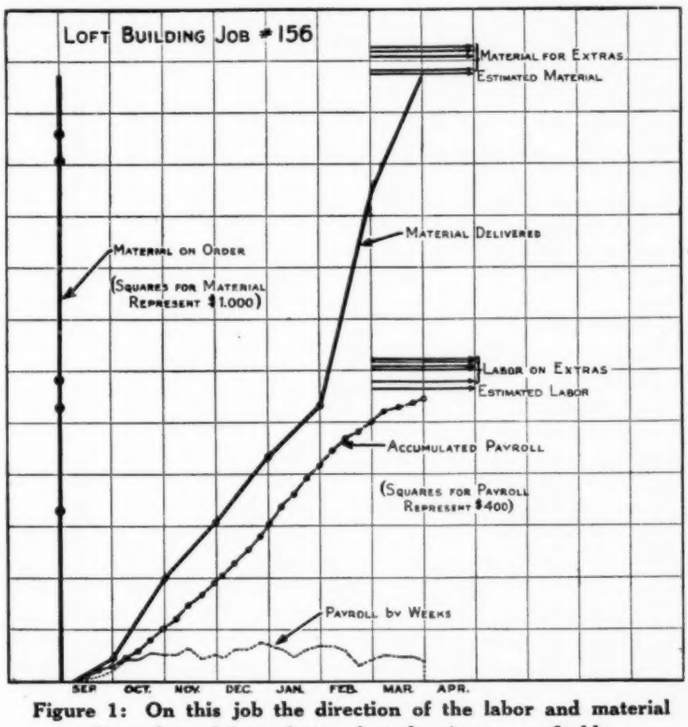
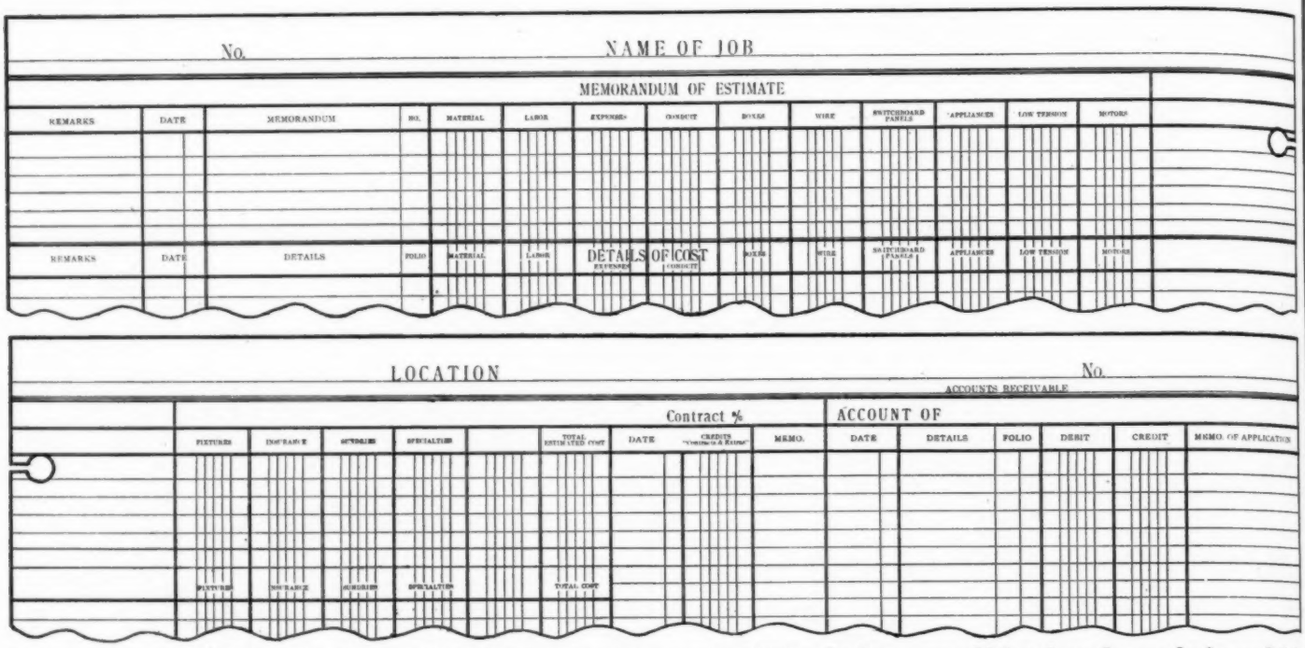


Figure 1: On this job the direction of the labor and material lines showed from first to last that it was profitable



Back and front of job ledger sheet. From these the Taverner Corp oration obtains the figures on which to base the graphs for each job

job shown on Figure 2, labor costs were increased tremendously by the general contractor, who was also the promoter, through his practice of slowing down construction almost to the stopping point for a time and then spurting for several weeks. The results of this is shown in the average weekly payroll curve at the bottom of the graph. The next time this contractor asks the company for bids, enough will be tacked on to cover the cost of his uneven building tactics.

The system has also shown that on city jobs there is an added 10 percent in labor costs due to the multiplex checking given the work by municipal employees. This has been taken care of on all bids since it came to light.

It is an extremely simple matter for the bookkeeping department to prepare these graphs every week. For twenty-one jobs in progress it requires only forty-five minutes to bring the graphs up to date after the figures are made up.

One of the strongest points of the system, as it has been developed by Mr. Taverner, is its extreme simplicity. The first impulse of the average person would be to plot all the details of a job. Showing many more quantities on the chart would inevitably have the effect of complicating it so much that its value as a "picture" would be lost. As it is, with just four quantities shown it is the work of only an instant to interpret it.

There are illustrated here also the front and back of the job ledger sheet, used in a loose-leaf ledger, from which the quantities on the graph are computed. Its divisions are self explanatory.

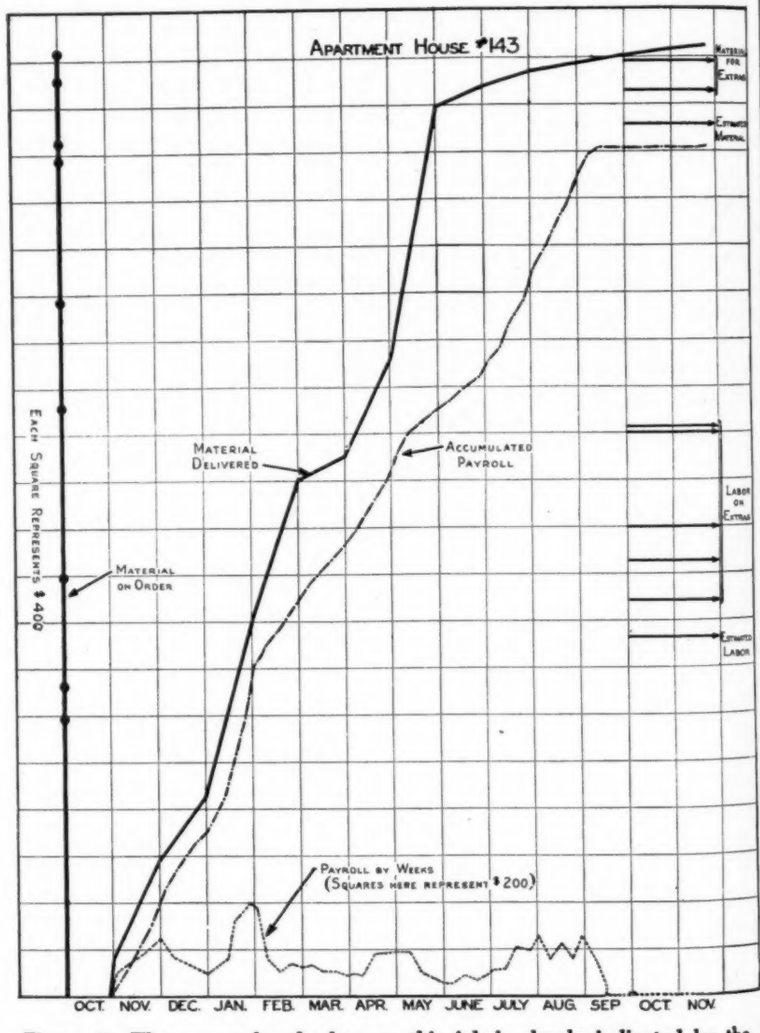

APARTMENT HOUSE #143
MATERIAL FOR EXTRAS
ESTIMATED MATERIAL
MATERIAL DELIVERED
ACCUMULATED PAYROLL
LABOR ON EXTRAS
ESTIMATED LABOR
MATERIAL ON ORDER
EACH SQUARE REPRESENTS $400
PAYROLL BY WEEKS (SQUARES HERE REPRESENT $200)
OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEP. OCT. NOV.

Figure 2: The reason for the loss on this job is clearly indicated by the very uneven weekly payroll line

Association Lays Down Definite Trade Policy

Manufacturer through jobber to contractor and dealer to public is dictum of Executive Committee at March meeting.

Separation of lighting and appliance circuits recommended.

All-Metal activity to be directed towards congested areas.

Joseph A. Fowler of Memphis, Tenn., elected new president for two-year term.

Joseph A. Fowler, Memphis, Tenn., newly elected President of the Association of Electragists—International

WHAT in point of action was probably the most important meeting of the Executive Committee of the Association of Electragists, International, was held in New York on March 16 and 17. Out of this meeting came a clean cut policy of distribution, a definite direction to All-Metal activity and a recommendation for separate lighting and appliance circuits.

The meeting marked the retirement of President James R. Strong from active leadership after serving the Association for many years. He was succeeded by Joseph A. Fowler, president, Fowler Electric Company, Memphis, Tenn.

The resolution on trade policy was unanimously passed after a most thorough discussion in which there was pointed out the need for constructive leadership following the report a year ago of the Trade Policy Committee which outlined existing conditions generally.

The resolution was as follows: That the Trade Policy Committee and the President be instructed to carry out vigorously the policy of this Association—that is, that distribution shall be from manufacturer through jobber through contractor and dealer to consumer.

This it will be noticed is quite definite. The full force and purport will be better realized after reading the statement of President Fowler which appears on page 12.

The Executive Committee in studying the development of the All-Metal program as carried on during the past year were convinced that the most important step to be taken next is the direction of All-Metal activity to all congested districts and those classes of buildings housing large numbers of people, rather than an indiscriminate application of the standard. Therefore, in planning for the activities which are to be carried on during the coming year to further the All-Metal standard, the committee adopted the following resolution:

"That until further action the activities of the Association towards an All-Metal Code be directed to the furthering of All-Metal standards in congested districts and in certain classes of buildings to be further determined."

The mistreatment of branch circuits by householders through over fusing again came up and the Committee went on record as follows:

That the Executive Committee request our representative on the Electrical Committee to work for a Code requirement that lighting outlets for both ceiling and brackets be on circuits independent from all other outlets.

While this carries no definite recommendation as to wire and fuse size for the different circuits it was brought out that it would require noninterchangeability of fuses for lighting circuits which it was thought would not be pro-

hibitive financially to the manufacturers.

Another change in policy was the decision to make all meetings of this committee executive. For years they have been open but it was felt that the committee needed to have greater opportunity for freedom of expression of opinion.

Also the Executive Committee which has been meeting in the spring and at convention time in the fall will hereafter meet more often, the next meeting being scheduled for June 22 and 23 in Chicago.

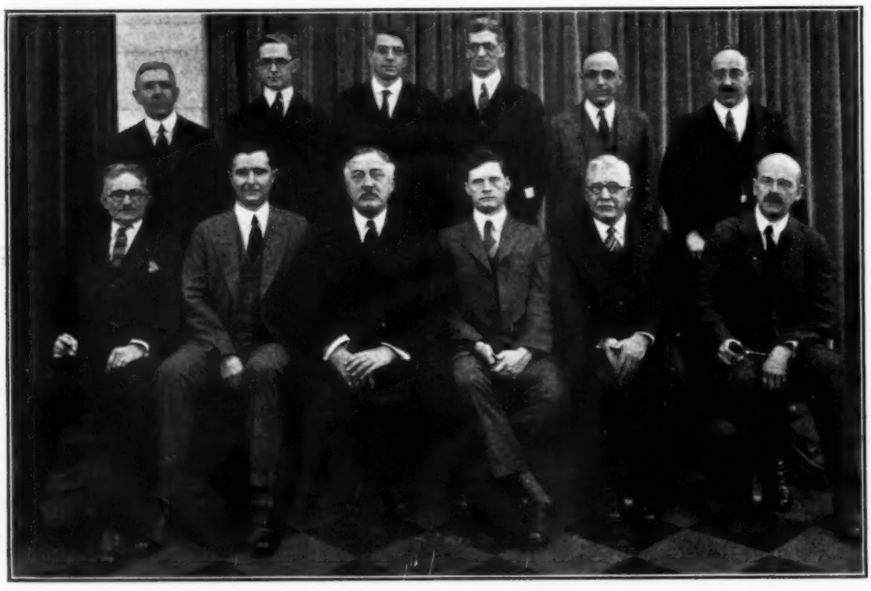
Persuant to resolutions passed by the Association in the last convention authorizing the appointment of a Business Conduct Committee which shall be charged with the duty of reporting periodically to the Executive Committee any failure on the part of members to observe the provision of the Principles of Business Conduct as promulgated by the Chamber of Commerce of the United States and adopted by the Association the following committee was appointed:

L. K. Comstock, New York.
W. H. Morton, Indianapolis.
W. A. Jackson, Chicago.
A. Penn Denton, Kansas City.
H. H. Walker, Los Angeles.

The election for executive committeeman at large resulted in the selection of W. A. Jackson, W. A. Jackson Company, Chicago.

At the conclusion of the meeting the following were appointed Chairmen of standing committees of the Association:

Membership Committee—C. L. Chamblin, San Francisco.
Publication Committee—L. K. Comstock, New York.
Electragists' Data Book Committee—E. C. Headrick, Denver.
Standardization Committee—W. A. Jackson, Chicago.
Architects & Engineers Committee, Including jurisdictional awards—E. McCleary, Detroit.
Liability Insurance Committee—J. A. Fowler, Memphis.
Cost Data Committee—J. H. Schumacher, Winnipeg.



This photograph of the Executive Committee of the A. E. I. was taken at the new lighting studios of the Edison Lamp Works, Harrison, N. J., with the model lighting system there. It required an exposure of only seven seconds to get this perfect picture

Credit and Accounting Committee—J. F. Buchanan, Philadelphia.
Trade Policy Committee—W. C. Peet, New York.
United States Chamber of Commerce Committee—L. K. Comstock, New York.
Legislation Committee—J. F. Buchanan, Philadelphia.
National Electrical Code Committee—A. Penn Denton, Kansas City.
International Relations Committee—R. A. L. Gray, Toronto.
Radio Committee—E. C. Hendrick, Denver.
Conventions & Meetings Committee—J. A. Fowler, Memphis.

As members of an advisory board to the president:

L. K. Comstock, Chairman, New York.
A. J. Hixon, Boston.
G. M. Sanborn, Indianapolis.
R. S. Stearnes, New Orleans.
James R. Strong, New York.
J. A. Kelly, Cleveland.
J. E. Aberbach, Detroit.

Mr. Strong was requested to continue as the representative of the Association on the executive committee of the National Electric Light Association, and L. K. Comstock was appointed National Councillor on the Chamber of Commerce of the United States.

The full committee was in attendance with the exception of Messrs. Comstock and Peet for whom J. A. Kelly, Cleveland, vice chairman of Union Shop Section and Paul H. Jaehnig, Newark, substituted respectively.

The new president of the Association of Electragists, International, Joseph A. Fowler, has been identified with the electrical business in Memphis, Tennessee, for the past twenty-six years. During that time he has grown to enjoy the esteem and confidence of the other branches of the industry nationally.

In his home town Mr. Fowler has the reputation of being an excellent organizer and harmonizer. He is known for his ability to bring disagreeing factions together and to secure their best thought and cooperation. These traits coupled with more than twelve years of service on the Executive Committee of the Association fit him unusually well for the position as leader of the electrical contracting and dealing industry.

Another quality that Mr. Fowler brings to the position is the character of experience he has had. He is the first president since 1912 to come from other than a major city, and the first in a number of years to be engaged in merchandising as well as contracting. His experience, therefore, is one more closely akin to the rank and file of the membership and should bring with it a deeply sympathetic attitude.

During his term of service as executive committeeman Mr. Fowler has made a number of important contributions to the industry's thinking and economic advancement. He was instrumental in securing for electrical contracting a separate classification on liability insurance. His address at the Chattanooga convention of the Association and his subsequent work as chairman of the Liability Insurance Committee found quick expression in the relief afforded

(Continued on page 25)

Estimating for Electrical Contractors

Lesson No. 4—Labor on Large Pipe, Wire, Panelboards and Cabinets

By ARTHUR L. ABBOTT
Technical Director, Association of Electragists

This is the fourth lesson in the Course in Estimating by America's foremost authority on this subject. The course started in the January issue and the first three articles concerned, respectively, the method of laying out a job preparatory to taking off quantities, the systematic method of taking off quantities, and labor on branch circuit conduit work. The present lesson gives labor data on large pipe, wire, panelboards and cabinets.—The Editor.

IN the first installment of this series it was stated that an estimate must be based upon the work to be done and upon the conditions under which it must be done. Following this rule, it was shown later that in the case of branch circuit roughing in, it is necessary to:

(1) Figure labor on pipe, boxes and pipe entrances.

(2) Employ labor units applying to the class of construction used in the building.

(3) Add a calculated percentage to the labor to cover the job conditions.

Large conduit is installed in an entirely different manner and under different conditions, hence while the fundamental rule applies, a different method must be employed for making the labor estimate.

The work to be done in installing large conduit consists of five operations:

(a) Transporting the material from the stock pile to its final location in the building.

(b) Coupling lengths together or coupling pipe to elbows.

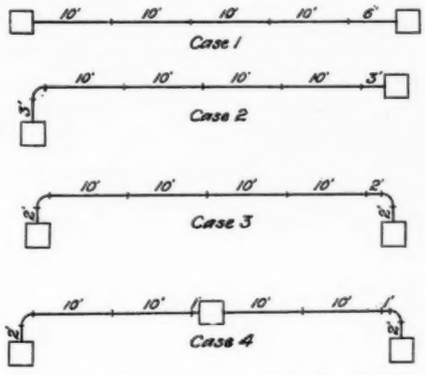
(c) Cutting and threading.

(d) Making bends.

(e) Attaching the pipe to pull boxes, cabinets and conduits or other similar fittings.

These operations are fully covered by applying the proper labor units to four items—feet of pipe, number of elbows, number of terminals and number of bends. The labor per 100 ft. of pipe includes transporting and coupling. Elbows must be transported and coupled into the run and necessitate cutting and threading the pipe. Terminals necessitate cutting and threading and attaching to a box or fitting. The logic of this method of estimating the labor may be better understood by considering the following typical cases.

Note than in each case we have 1 coupling per 10 feet of pipe (approximately), 2 couplings per elbow, 1 cut and thread per 2 terminals, 1 cut and thread per elbow.



Case 1—46 ft. of pipe, 2 terminals—4 couplings, 1 cut and thread.

Case 2—46 ft. of pipe, 2 terminals, 1 elbow—6 couplings, 2 cuts and threads.

Case 3—46 ft. of pipe, 2 terminals, 2 elbows—8 couplings, 3 cuts and threads.

Case 4—46 ft. of pipe, 4 terminals, 2 elbows—8 couplings, 4 cuts and threads.

It is possible to sketch a layout in which these ratios do not hold good exactly, but the above cases are typical of the average case met in practice. We may therefore consider that the law is pretty well established. It is plain that except for bends, all the labor can be covered by taking into account the feet of pipe, and number of elbows and terminals, also that no method of estimating can be accurate which does not take these items into account.

The time required to make a bend in a pipe of large size is a somewhat uncertain quantity, because there are no standard appliances in common use for bending pipe larger than 1¼ in., but the standard times given in the table are fair allowances.

It is somewhat difficult to determine the number of bends which will be required in large sizes of conduit. For sizes up to and including 2 in. it is well to allow for a few bends, if there is any doubt as to the number required. Above this size bends are so difficult to make that it is important to determine as closely as possible the exact number required. A close approximation can be made if the estimator has a clear idea of the route to be followed by the feeder conduits. An offset is always considered as two bends.

Job Factor

The three items which determine the job factor for branch circuit work have little or no effect on the feeder work and so need not be considered here. Large pipe is usually run exposed. Labor should be figured on the hangers or other supports as a separate item, hence the pipe labor is independent of the type of building construction. The only variations found in the labor are those dependent upon the location of the runs of conduit and slight variations dependent upon the "density."

The most common location for runs of large conduit are (1) suspended from hangers about 10 ft. above the floor, and (2) in vertical shafts. The standard times given in Table 1 apply to either one of these two locations. Deductions and additions are given to correct these units for other methods of installation. By the "density" is meant the number of conduits carried along together in one run. Some time is saved if there are several conduits grouped

STANDARD TIMES

Table 1

CONDUIT
FEEDERS AND MOTOR CIRCUITS
Time in hours

Size	Conduit per 100 ft.	Elbows Each	Terminals Each	Bends Each
½	1.6		.23	.073
¾	2.2		.27	.085
1	3.1	1.11	.38	.17
1¼	4.1	1.57	.53	.43
1½	4.75	1.88	.65	.58
2	5.9	2.52	.88	.93
2½	7.7	3.71	1.35	1.7
3	10.5	4.84	1.77	2.4
3½	11.4	5.50	2.10	3.1
4	12.3	6.36	2.5	3.7

Location

A	Horizontal, in floor slab or in concrete under basement floor	deduct 10%
B	Horizontal, on hangers—10 ft. above floor—Standard condition. For each additional foot above 10 ft. up to a limit of 30′ above floor	add 2%
C	Vertical, in pipe shaft or in elevator shaft—Same as standard condition.	
D	Vertical, through sleeves built into floor slabs	add 5%
E	Vertical, built into a wall and carried up as the building progresses	add 15%
F	Typical motor circuit, exposed on wall, ceiling or floor	add 20%

Density

For each pipe after the first in a group installed together up to 10 deduct 1½%

NOTE—No allowance is included in any of above figures for trenching, cutting, drilling, installing sleeves, or any labor on supports or fastenings.

in this way and a small deduction is accordingly made.

It will be noted that a "typical motor circuit" is considered as in a class by itself and carries an addition of 20 percent to the standard times. This is intended to apply to the motor circuits which are incidental to the complete wiring of a building. Such work is usually more or less scattered, that is, there is only a little of it in any one location; the wiring for one motor is likely to be an isolated job. The work usually is some distance from the base of supplies, each job is a small one, and much time is lost in getting the tools and materials together and getting started on the work, and in picking up after the work is done.

For ordinary jobs, the estimator is not expected to segregate the large conduit into the various classes as to location and density which are described in the table. He should select the particular conditions which seem to be about the average for the job in question, and figure all the large pipe on this basis. There are cases, however, where a quantity of pipe to be installed under special conditions is sufficiently large to warrant segregating it and figuring the labor as a separate item, as for example a number of large conduits to be run a considerable distance through a tunnel.

The method outlined in the preceeding paragraphs, making use of Table 1, is the accurate method and the one which should be generally used.

There are two cases however where it is better to use an approximate method which is somewhat shorter. First, in making a preliminary estimate, where sizes and quantities are only approximate, it would obviously be a waste of time to go into much detail in estimating the labor. Second, in a case where the estimate, though it is to be the basis for a bid, must unavoidably be made without a full knowledge of all conditions. It is said that there was once a man who took measurements with a combination of a length of clothes-line and a micrometer. Estimators are not advised to follow this example. When the quantities can only be determined approximately, the approximate labor units given in Table 1-A should be used.

While the subject of this section is large pipe, the tables include unit times for ½ inch, ¾ inch, and 1 inch. Some pipe of these sizes is often installed along with and in the same manner as the larger sizes, and units are therefore provided so that the labor can be figured in the same way. A comparatively small amount of feeder or motor circuit pipe of the smaller sizes should usually be combined with the lighting branch circuit pipe in order to save time.

STANDARD TIMES

Table 1-A

CONDUIT
FEEDERS AND MOTOR CIRCUITS

Size	Conduit Hours per 100 ft.	Elbows Hours Each
½	5.1	
¾	6.3	
1	9.5	1.2
1¼	11.3	1.6
1½	13.7	2.1
2	18.2	2.8
2½	23.3	4.1
3	31.0	5.3
3½	35.6	6.1
4	41.0	7.0

Branch Circuit Wire

There is some variation in labor records on the item of pulling in branch circuit wire, because there are two different methods used by contractors in doing this work. Some consider it to be the best practice to do all testing and make all necessary splices at the outlets as a part of the wire-pulling operation. Others think it more economical to do this work in connection with the operation of installing switches and receptacles. The unit times given in Table 2 include time for testing and splicing.

STANDARD TIMES

Table 2

WIRE—LIGHTING BRANCH CIRCUITS
Time allowance for making splices at outlets is included.

Single Wire	Hours per 1000′ No. 14	No. 12
Simple layout with very few switches—Warehouse, Factory, or Small Store Building	6	6.5
Complex layout — Residence or Club House	10.5	11.3

For duplex wire, figure the same time per 1000′ of conductor as for single wire, less 5%.

There will evidently be less splicing to do if the circuit layout is simple than in the case of a more complex layout where the runs are short and there are many switches. The two unit times given in the table represent respectively the best and the most unfavorable conditions.

An experiment was made in a large building in which the circuit layout was very simple, to determine the relative economy in labor of single and duplex wire. Four typical floors were selected, which were identical in every way. Single wire was used on two of these floors and duplex on the other two, the same men doing the work in every case. It was found that the labor per 1000 ft. of conductor was about 5 percent less in the case of the duplex than where the single wire was used. Different results might be found in a building where the runs are short and the layout is more complex, but it does not seem probable that the use of duplex wire would show a saving in labor sufficient to make up for the additional cost of the material.

Large Wire

The work to be done in pulling in large wire involves a number of operations which are almost entirely inde-

STANDARD TIMES

LARGE WIRE—THREE CONDUCTORS PER PIPE

Table 3

Size	Feet to Weigh 150 lbs.	Constant Time Hrs. Per Run: For Runs requiring less than 150 lbs. of wire	Constant Time Hrs. Per Run: For Runs requiring more than 150 lbs. of wire	Fishing and Pulling Time Hours per 1000 ft.
10		.5		5.9
8		.5		7.2
6		.6		10.0
4	714	.7	2.4	12.2
3	600	.8	2.7	13.3
2	500	.8	3.2	14.4
1	390	.9	3.6	16.7
0	320	1.1	4.0	18.7
2/0	257	1.2	4.8	20.8
3/0	214	1.4	5.8	22.6
4/0	173	1.6	6.6	25.1
250000	144	1.9	7.2	26.9
300000	123	2.1	8.4	29.1
350000	108	2.3	9.3	31.0
400000	96	2.6	10.2	32.4
450000	86	2.8	11.3	34.0
500000	78	3.1	12.4	35.6
600000	65	3.6	14.2	38.1
700000	56	4.1	16.0	40.8
750000	53	4.3	16.9	41.7
800000	50	4.6	17.8	43.0
900000	45	5.0	19.3	44.4
1000000	40	5.5	21.0	46.0

Table 3-A

Size	Hours per 1,000 ft. for runs of following lengths: Total Length of wire in run: 100′	150′	300′ & Over: 300′	500′	1,000′
10	11	9	6.7		
8	12	10.5	8		
6	16	13	11		
4	19	17	13		
3	21	19	15		
2	22	20	17	21	18
1	26	23	20	24	20
0	30	26	22	27	23
2/0	33	29	37	30	26
3/0	37	32	42	34	28
4/0	41	36	47	38	32
250000	46	75	51	41	34
300000	50	85	57	46	38
350000	54	93	62	50	40
400000	134	100	66	53	43
450000	147	109	72	57	45
500000	160	118	77	60	48
600000	180	133	85	67	52
700000	201	147	94	73	57
750000	211	154	98	76	59
800000	221	162	102	79	61
900000	237	173	109	83	64
1000000	256	186	116	88	67

NOTE—The total time to install a given run of wire is the constant time for the run, plus the fishing and pulling time (feet times hours per 1000 ft. divided by 1000).

pendent of the length of the wire, such as moving and blocking up the reel, rigging block and tackle, cutting off the cable and securing it to the wire or cable used for pulling. The time thus spent may be called "preparation time" and may be considered a constant or unchanging time for any large amount of a given size of wire.

The largest single item in this constant time is moving the reel. When only a short length of cable is needed for a run, the reel will not be moved, but the required length will be cut off and carried to the point where it is to be fed into the pipe. The maximum quantity which will be handled in this way will vary in actual practice, but is assumed to be always a length which will weigh 150 lbs. We will therefore have two preparation times for each size of wire, one for lengths weighing more than 150 lbs. and one for lengths weighing 150 lbs. or less.

The labor required for fishing the conduit, pulling in the cable and often some other operations, is proportional to the length of the run. Therefore the total time required to pull in a given run of wire will be made up of two items, the preparation time and a time allowance per foot or per 1000 ft. for fishing and pulling. It is easily seen that the net result of this method of estimating is the use of a variable time allowance per 1000 ft. which in general decreases as the length of the run increases.

Much more accurate results will be obtained in this way than by using one unit time per 1000 ft. for all runs of a given size of wire. However, actual cost records must be expected to show some variation, for it is not practical to take into account all the variable factors which may affect the labor.

Table 3 gives for each size of wire the quantity weighing 150 lbs., the two constant or preparation times, and the fishing and pulling time per 1000 ft.

When this table is used, the entries on the pricing sheet will be in the following form:

		Unit Hours	Total Hours
No. 3/0 Wire	725 Ft.	22.6	16.39
Runs under 150 lbs.	1	1.4	1.40
Runs over 150 lbs.	2	5.8	11.60
250,000 C. M.	1100 Ft.	26.9	29.59
Runs under 150 lbs.	2	1.9	3.80
Runs over 150 lbs.	3	7.2	21.60

From Table 3 the total time for any length of run may be calculated and this may be reduced to hours per 1000 ft. This has been done for five different lengths (See Table 3-A). In order to save time, this table may be used in place of Table 3, selecting the unit time for each size of wire corresponding to the average length of run for that size.

The data presented in the tables for large wire all applies to the common case of three separate wires or cables pulled into one conduit. Conclusive data is lacking as to the increase or decrease in the labor when two, four or more than four wires are pulled in together, but such data as is available indicates little or no variation from the figures in the tables.

Cabinets and Panelboards

Installing this material may include any of the following operations:

Installing the cabinet, which may be flush or surface type.

Attaching cut-out blocks to the cabinet.

Attaching a panelboard to the cabinet.

Placing barriers (in gutter type boxes).

Connecting wires and cables.

Placing the trim.

Considering the cabinet alone, we have boxes of the gutter type which require a separate front or trim, and the type which has an attached door.

The labor required to install a cabinet will be to some extent proportional to its weight, which involves height, width and depth. It would, however, be an unnecessary complication to take the depth into account as the labor can be figured with sufficient accuracy by considering only the area of the back of the box, that is the height multiplied by the width. In the case of cabinets which are not to contain panelboards or similar apparatus, such as telephone cabinets or pull-boxes, the estimator usually knows the approximate size of the cabinet. For such cases, Table 4 gives the hours of labor for various sizes of cabinets without trim, also the additional labor for installing a trim for each size of cabinet.

STANDARD TIMES

Table 4
CABINETS

Square Feet	Hrs. each Cab. without trim	Hrs. each Trim
1	1.67	.33
2	2.27	.40
3	2.70	.43
4	3.03	.47
5	3.33	.50
6	3.53	.60
8	4.00	.67
10	4.42	.80
12	4.83	.90
14	5.27	1.03
16	5.67	1.17
18	6.10	1.27
20	6.50	1.40
22	7.00	1.53
24	7.33	1.67

Time Per Terminal

In the case of cabinets containing panelboards, the estimator knows the number and ampere capacity of all circuits and main connections, but usually does not know the size of the cabinet. The only practical method of estimating therefore is to combine the labor on the cabinet and the panelboard and figure this at a unit time per terminal of each size. This involves the assumption that a terminal of a given size on a panelboard always calls for a fixed number of square inches of cabinet size, which is not strictly true, but the percentage of error is too small to be important. The unit times are given in Table 5.

As stated in Lesson II it is preferable to compute the hours of labor on all panelboards and cabinets on a schedule sheet, then if this material is entered on the pricing sheet as "Panels and Cabinets as per Specifications" and the lump sum price is set down, the total labor hours for the lot can be shown, or if each panel and cabinet is listed separately, the labor hours for each item can be entered. The calculations can most easily be made by using a tabulation such as that shown in Lesson II and which is reproduced here as Table 5-A.

Labor on Cabinets

The unit times given in Table 5 may also be used for approximate figures on the labor required to install cabinets and mount and connect any such apparatus as cutout blocks or knife switches.

Thus, suppose that two 3 to 2 wire double-branch plug cutouts are to be installed in a steel box. There are 7-30 amp. terminals on each cutout. Fourteen terminals at .27 hour each = 3.78 hours which is not far from right, if all time for drilling holes and attaching cutouts to the box is included. Or if a 100 amp. 3 pole knife switch and cabinet are to be installed, we have 6-100 amp. terminals. Six terminals at .78 hour each = 4.68 hours to cover drilling holes in box, mounting the switch, installing the cabinet and sweating on 6-100 amp. lugs.

It is common practice to run large

STANDARD TIMES

Table 5
PANEL BOARDS AND CABINETS
Labor Per Terminal

Size Terminal Amp.	Hours Panel Only	Hours Panel and Cab.
30	.17	.27
60	.40	.55
100	.53	.78
200	.70	1.13
400	1.03	1.63
600	1.67	2.62

Table 5-A

Terminals / Hours Ea.	30amp. .27	60amp. .55	100amp. .78	200amp. 1.13	400amp, 1.63	
Cab. No.						Hours
Main	1	3		6	7	20.11
B	12	3				4.89
1A	28		3			7.90
1B	32		3			10.98
2A	28		3			7.90
2B	24	3	3			10.47
3A	20	3				6.05
3B	20	3				6.05

STANDARD TIMES

Table 6
MAKING WRAPPED AND SOLDERED FEEDER TAPS
Hours per tap

Size Tap	Size Main: No. 8 to No. 2 Hours	No. 1 to No. 3/0 Hours	No. 4/0 to 300,000 Hours	400,000 to 600,000 Hours	700,000 to 1,000,000 Hours
No. 8	.45	.50	.65	.8	.97
No. 6-No. 4	.70	.75	.85	1.0	1.2
No. 3	.78	.83	.95	1.1	1.3
No. 2-No. 1	1.00	1.10	1.23	1.4	1.55
No. 0-No. 2/0-No. 3/0		1.25	1.35	1.5	1.67
No. 4/0 to 250,000			1.90	2.1	2.2
300,000 to 400,000			2.00	2.2	2.4
500,000 to 600,000				3.1	3.3

NOTE—It is assumed that the size of tap is never larger than the size of the main cable.

Table 7
PUSH SWITCHES AND PLUG RECEPTACLES
Time in Hours per 100

	Hours
10 amp. S. P. Switch and plate	30
10 amp. 3-way Switch and plate	50
10 amp. 4-way Switch and plate	50
10 amp. Plug receptacle and plate	30

risers through a tier of cabinets which are set one over another on several floors of a building, and then to tap these mains in each cabinet with wires of sufficient size to supply that panelboard.

This forms an entirely separate operation, not allowed for in the units given in the table for panelboard labor, and must be figured as a separate item as per Table 6.

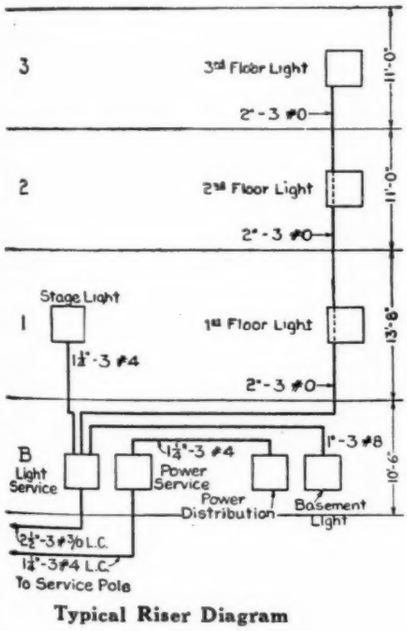
To complete the labor data applying to the "standard job," Table 7 is included giving the time for installing ordinary flush wall switches and flush receptacles.

Problems

1. Compute the labor required for each of the runs shown on page 17, using Table 1, the size of pipe being 2 in. in each case, installed under "normal" conditions.

2. Compute the labor for the same runs, and same size of pipe using Table 1-A.

3. Referring to the typical riser diagram reproduced from Lesson I, the total length of the service conduits is 50 ft., and they are



Typical Riser Diagram

carried up the service pole. The service cables are not to be lead covered. The lengths of conduits from service cabinets are as follows: To stage cabinet 28 ft.; to basement power cabinet 35 ft.; to basement light cabinet 64 ft.; to 1st floor main cabinet 80 ft. Compute the labor on all pipe and wire, neglecting any trenching required for service conduits.

4. Referring to Table 3-A, why is the labor for a run of No. 4/0 containing 300 ft. of cable 47 hours per 1000 ft., while the labor on a run containing 150 ft. is only 36 hours per 1000 ft.?

Solution of Problems in Lesson No. 3

1. *a* Area of one floor = 9350 sq. ft.
Area of three floors = 9350 sq. ft. x 3 = 28050 sq. ft.
a = 4
b = 3
c = 2
Job Factor = 9%

b Area of one floor = 36540 sq. ft.
a = 2
b = 5
c = 12
Job Factor = 19%

c Area of one floor = 13578 sq. ft.
a = 10
b = 4
c = 14
Job Factor = 28%

2.

		Unit Hours	per	Total Hours
½" Pipe	570'	1.13	C'	6.44
¾" Pipe	15'	1.48	C	.22
Ceiling Outlets	29	17.50	C	5.08
Wall Outlets	28	36.00	C	10.08
Pipe Entrances—				
Ceiling—½"	72	27.00	C	19.44
Ceiling—¾"	1	30.00	C	.30
Wall —½"	39	63.00	C	24.57
Wall —¾"	1	73.00	C	.73
				66.86
		Job Factor—20%		13.37
		Total Hours		80.23

3.

		Unit Hours	per	Total Hours
½" Pipe	3100'	1.13	C'	35.03
¾" Pipe	900'	1.48	C	13.32
1" Pipe	330'	2.10	C	6.93
Ceiling Outlets	200	15.50	C	31.00
Wall Outlets	90	36.00	C	32.40
Pipe Entrances—				
Ceiling—½"	380	18.00	C	68.40
Ceiling—¾"	55	21.00	C	11.55
Ceiling— 1"	15	36.00	C	5.40
Wall —½"	105	63.00	C	66.15
Wall —¾"	20	73.00	C	14.60
Wall — 1"	5	98.00	C	4.90
				289.68
		Job Factor—25%		72.42
		Total Hours		362.10
		Average rate		$ .90
		Total Cost		$325.89

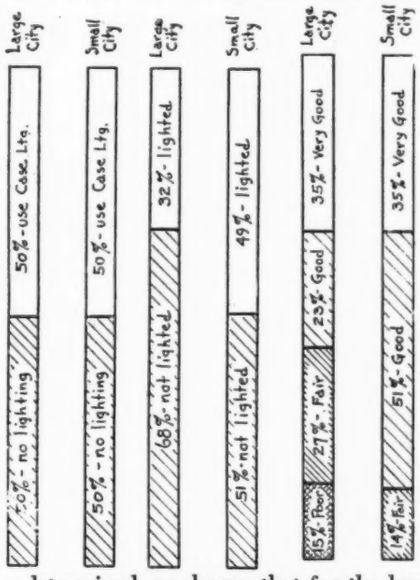
Average Crew—1 man at $ .90 per hour.
—1 man at 1.15 per hour.
—1 man at .65 per hour.
$2.70

$\frac{\$2.70}{3} = \$.90$ = average rate per hr.

Display Case Lighting a Large Sales Field

Opportunities for the contractor-dealer to sell display-case lighting are disclosed by a survey made by J. L. Stair and William Foulks and treated in a paper presented at the 1924 convention of the Illuminating Engineering Society. The survey included all types of stores except department stores. In classifying stores as to whether they employ lighting equipment in display cases it was found that exactly 50 percent used lighting and 50 percent did not.

In making up these figures a store was counted as using lighting equipment regardless of the amount employed. The results of the survey are shown graphically in the illustration. A record was made of the total number of lineal feet of display cases of all kinds and it was



determined, as shown, that for the large city surveyed 32 percent of the total were equipped with lighting, whereas 68 percent were not so equipped.

An analysis was also made of the character of the lighting that was found; the results as shown in the cut were:

15 percent were poorly lighted.

27 percent had fair lighting.

23 percent were illuminated to a good intensity.

35 percent were lighted with what may be called a very good intensity.

To establish a more definite basis of comparison poor lighting was considered as equal to about an average of two foot-candles intensity, fair lighting as ten foot-candles, good lighting as fifteen foot-candles and very good lighting as twenty foot-candles intensity.

Combined Work Order and Acknowledgment Form

After a contract has been secured or any order to do work has been received the machinery of the contractor's organization must be set in motion to execute the work. This requires that instructions be issued by some authorized party to the superintendent to proceed with the work. These instructions should in every office be in the form of a written order. Even though the entire organization may consist of one individual, who acts as general manager, estimator, superintendent, bookkeeper, janitor, etc., etc., the written form should be used, so as to have a record of all orders received and a memorandum of the nature of the work.

The form used for this purpose by Peet & Powers, New York City, and reproduced here, is the best the writer has ever seen. Few electrical contractors make use of an Order Acknowledgement form. The very great value of sending an acknowledgment of every order to the customer can easily be seen. Most disputes between the contractor and his customer are caused by misunderstandings and probably three-fourths of these misunderstandings can be eliminated by using such a form. Being combined with the Work Order no additional office labor is required to write out the acknowledgment.

The form as used by Peet & Powers is in quadruplicate. The original is the acknowledgment, the second copy is the bookkeeper's record, the third and fourth go to the superintendent, the fourth being given by the superintendent to the wireman in the case of a small job, or to the job foreman on larger work. Blank spaces are provided on the reverse of the fourth copy for the data on which work was started and completed, signatures of the journeyman in charge of the work and of the superintendent are required on second, third and fourth copies. After the completion of the work the fourth copy becomes the formal notification from the superintendent to the cost clerk that the job is done and is ready for billing.

The first copy, or the acknowledgment, is printed in copying ink and is copied in a tissue paper copying book before being mailed to the customer. As a general rule, this copying could be eliminated and the second copy, which is kept in a suitable binder, could be used for general reference in the office.

The notation in regard to reporting additional work, near the bottom of the fourth or workman's copy, is very important. It very frequently occurs on small jobbing work that the customer directs the workman to do work not covered by the original order. Such items may often slip through without being charged for if the workman is not specifically instructed to report them.

It is suggested that the form could be slightly improved by making the size 6 in.x8 1-2 in. instead of 4 1-4 in.x9 in. The former size would fit nicely in either a No. 6 1-2 or No. 10 1-2 envelope and would allow some additional space for the description of the work.

A new blank form is usually looked on by the contractor as so much additional red tape, to be avoided in any way possible. Frequently, however, a slight change can be made in the office routine which will save expense, even though it involves an additional form. To any contractors who do not now make use of both a work order and an order acknowledgment study of these forms should be of value.

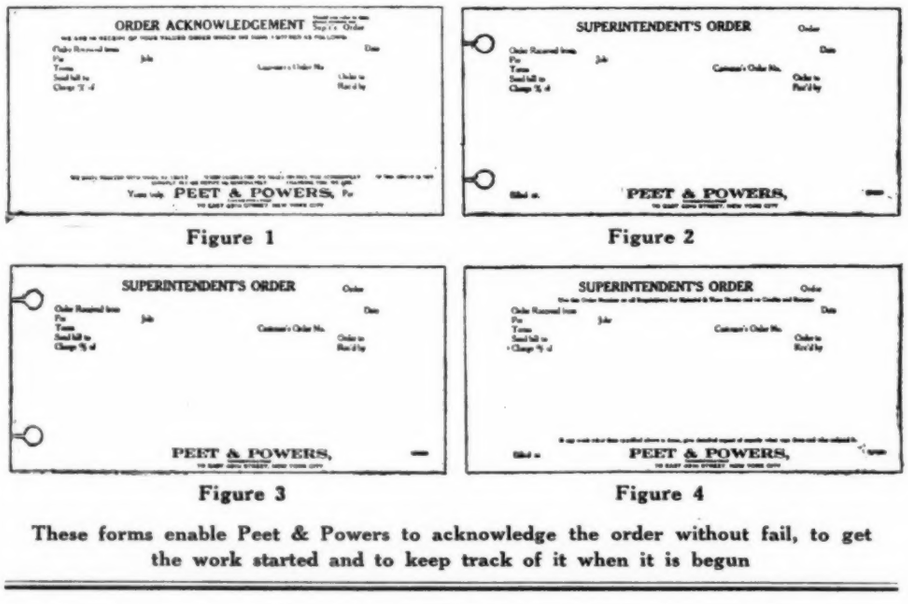


Figure 1 Figure 2

Figure 3 Figure 4

These forms enable Peet & Powers to acknowledge the order without fail, to get the work started and to keep track of it when it is begun

What Not to Do

An illustration of the fact that in order to sell people a dealer must know something about what they like and dislike is furnished by a lamp agent who deals largely with the residents of Chinatown, New York City. Recently when lamp prices were reduced he sent out a postal card. A week went by and not an order had arrived. The dealer set out to discover why. At his first stop he got the answer. The postal card he had sent out was yellow. And yellow to the Chinese is the death color.

James R. Strong Honored

Receives illuminated testimonial upon his retirement from presidency of the A. E. I. after seven years of service

AS an expression of the high regard in which James Remsen Strong, retiring president of the Association of Electragists, International, is held by his colleagues in the electrical fraternity, an illuminated testimonial was presented to him by the Association at a dinner given in his honor March 16 at the Builders' Exchange, New York City. The dinner was attended by seventy-five leaders in the industry, among whom were many who helped form the National Association back in 1901.

Among the speakers who told of his long record of unselfish service were Samuel Hilton of Syracuse and J. C. Hatzel, president of Hatzel & Buehler, Inc., New York, both being charter members of the organization; E. McCleary, second president of the A. E. I. and present executive committeeman; Charles L. Eidlitz, first president, who now heads the New York Electrical Board of Trade, and William L. Goodwin of the Society for Electrical Endeavor. The testimonial was presented by Mr. Eidlitz. Joseph A. Fowler, newly elected president of the A. E. I., presided as toastmaster.

Each of the speakers voiced the sentiment that was in the hearts of all present and best expressed in the testimonial as follows:

". . . . . to bear witness to his years of service. His intelligent initiative, brilliant ability, untiring energy, faithful service and ardent devotion in the performance of his duties have been an invaluable asset throughout the years.

"The noble qualities of heart and mind which he has shown on all occasions not only in his work with the Executive Committee but also as the presiding officer of the Association, have endeared him as our leader.

"He has been to all the Association, guide, philosopher, friend."

Mr. Strong has the distinction of having administered the affairs of the Association for almost a third of its existance. He was first elected president in 1905, serving for three years; and again in 1921, continuing in office until last month.

On the occasion of the retirement of
James Remsen Strong
from the Presidency of the
Association of Electragists
International
it is the pleasure of the Executive Committee and Past Presidents of the Association, whose signatures appear below, who act not alone for themselves but also for their Association, to bear witness to his years of service.

His intelligent initiative, brilliant ability, untiring energy, faithful service and ardent devotion in the performance of his duties
Has Been An Invaluable Asset Through The Years.

The noble qualities of heart and mind which he has shown on all occasions, not only in his work with the Executive Committee, but also as the presiding officer of the Association, has endeared him as
Our Leader.

He has been to all the Association,
Guide, Philosopher and Friend.

Past Presidents
Chas. L. Eidlitz
Geo. M. Phantom
Ernest Freeman
Jos. H. Hatzel
Robt. S. Dalton
E. McCleary
March 16, 1925
Lawrence W. Davis
Secretary

Executive Committee
W. Goodwin
Joseph A. Fowler
Joseph C. Crosby
Wm. L. Goodwin
Lee Cary Ross
Wm. L. Chamberlin
Ernest C. Hendrick
W. A. Lacy
E. C. Carter

A reproduction of the beautifully illuminated testimonial presented to the retiring president

It is as an administrator and counselor that Mr. Strong's greatest strength is found. There are few men in the electrical industry whose judgment is respected as is that of Mr. Strong. This, together with certain personal attributes such as integrity, courage, directness and kindliness, has built for him a host of friends in every corner of the industry.

Because of these characteristics he has been able, as few others could, to bring the problems of the contractor to each of the other groups. For a number of years he has sat on the Executive Committee of the National Electric Light

Association as representing his Association. At the insistence of the new administration he has consented to continue this relation.

Mr. Strong is deeply imbued with the association idea. He believes in organization and has unselfishly given of his time to promote every organization of which he is a member. At the present time he is a member of the Lighting Educational Committee; Director, Society for Electrical Development; Member Executive Committee, National Electric Light Association; Director, Electrical Board of Trade of New York; Chairman Executive Committee, Electrical Contractors' Association of New York; Member Advisory Committee, New York Electrical League; Director, Electrical Show Company, New York; Member Board of Governors, Building Trades Employers' Association, New York; Treasurer, Credit Association of the Building Trades of New York, and he has now consented to become a member of the Advisory Board to the President of the A. E. I.

Born in New York October 28, 1861, he graduated from Trinity College in 1882. For four years he was in the factories of the Watts Campbell Corliss Engine Works and the United States Electric Lighting Company, Newark, New Jersey. During the next few years he was superintendent of construction for the United States Illuminating Company in New York. Since 1890 he has been president of the Tucker Electrical Construction Company, electrical contractors, New York.

Federal Arbitration Law Becomes a Reality

A SIMPLE and unobtrusive method of settling business disputes quickly, without going through the red tape and delay of court procedure, is provided in the new Federal Arbitration Law, which was passed by Congress on Feb. 12. In effect the law makes private arbitrations, under the conditions named, have the same weight at law as a court decision and such decisions can be taken into any Federal court and judgment secured.

The most important provisions of the new statute make the decision of an arbiter valid; empower a court to appoint an arbiter if both parties have previously agreed to arbitrate any difference arising from their business relations; give the arbiter the power of subpoena; and finally, if difficulties arise after the decision of the arbiter, empower the court to enforce the reward. However a court can declare an arbiter's award void for several reasons or may modify the award if, in the court's judgment, it is unreasonable.

The statute, known as "An act to make valid and enforceable written provisions or agreements for arbitration of disputes arising out of contracts, maritime transactions, or commerce among the States or Territories or with foreign nations." is printed, in part, below:

Sec. 1. . . . . nothing herein contained shall apply to contracts of employment of seamen, railroad employees, or any other class of workers engaged in foreign or interstate commerce.

"Sec. 2. That a written provision in any maritime transaction or a contract evidencing a transaction involving commerce to settle by arbitration a controversy thereafter arising out of such contract or transaction, or the refusal to perform the whole or any part thereof, or an agreement in writing to submit to arbitration an existing controversy arising out of such a contract, transaction, or refusal, shall be valid, irrevocable, and enforceable, save upon such grounds as exist at law or in equity for the revocation of any contract.

"Sec. 3. That, if any suit or proceeding be brought in any of the courts of the United States upon any issue referable to arbitration under an agreement in writing for such arbitration, the court in which such suit is pending, upon being satisfied that the issue involved in such suit or proceeding is referable to arbitration under such an agreement, shall on application of one of the parties stay the trial of the action until such arbitration has been had in accordance with the terms of the agreement, providing the applicant for the stay is not in default in proceeding with such arbitration.

"Sec. 4. That a party aggrieved by the alleged failure, neglect, or refusal of another to arbitrate under a written agreement for arbitration may petition any court of the United States which, save for such agreement, would have jurisdiction, under the judicial code at law, in equity, or in admiralty of the subject matter of a suit arising out of the controversy between the parties, for an order directing that such arbitration proceed in the manner provided for in such agreement. Five days' notice in writing of such application shall be served upon the party in default. . . . . The court shall hear the parties, and upon being satisfied that the making of the agreement for arbitration or the failure to comply therewith is not in issue, the court shall make an order directing the parties to proceed to arbitration in accordance with the terms of the agreement. . . . .

"Sec. 5. That if in the agreement provision be made for a method of naming or appointing an arbitrator or arbitrators or an umpire, such method shall be followed; but if no method be provided therein, or if a method be provided and any party thereto shall fail to avail himself of such method, or if for any other reason there shall be a lapse in the naming of an arbitrator or arbitrators or umpire, or in filling a vacancy, then upon the application of either party to the controversy the court shall designate and appoint an arbitrator or arbitrators or umpire. . . . .

"Sec. 7. That the arbitrators selected either as prescribed in this Act or otherwise, or a majority of them, may summon in writing any person to attend before them or any of them as a witness and in a proper case to bring with him or them any book, record, document, or paper which may be deemed material as evidence in the case. . . . . Said summons shall issue in the name of the arbitrator or arbitrators, or a majority of them, and shall be signed by the arbitrators, or a majority of them, and shall be directed to the said person and shall be served in the same manner as subpoenas to appear and testify before the court; if any person or persons so summoned to testify shall refuse or neglect to obey said summons, upon petition the United States court in and for the district in which such arbitrators, or a majority of them, are sitting may compel the attendance of such person or persons before said arbitrator or arbitrators, or punish said person or persons for contempt in the same manner now provided for securing the attendance of witnesses or their punishment for neglect or refusal to attend in the courts of the United States.

"Sec. 9. If the parties in their agreement have agreed that a judgment of the court shall be entered upon the award made pursuant to the arbitration, and shall specify the court, then at any time within one year after the award is made any party to the arbitration may apply to the court so specified for an order confirming the award, and thereupon the court must grant such an order unless the award is vacated, modified, or corrected. . . .

"Sec. 10. That in either of the following cases the United States court in and for the district wherein the award was made may make an order vacating the award upon the application of any party to the arbitration—

(a) Where the award was procured by corruption, fraud, or undue means.

(b) Where there was evident partiality or corruption in the arbitrators, or either of them.

(c) Where the arbitrators were guilty of misconduct. . . . . .

(d) Where the arbitrators exceeded their powers. . . . . .

(e) Where an award is vacated and the time within which the agreement required the award to be made has not expired the court may, in its discretion, direct a rehearing by the arbitrators.

"Sec. 11. That in either of the following cases the United States court in and for the district wherein the award was made may make an order modifying or correcting the award upon the application of any party to the arbitration—

(a) Where there was an evident material miscalculation of figures or an evident material mistake in the description of any person, thing, or property referred to in the award.

(b) Where the arbitrators have awarded upon a matter not submitted to them, unless it is a matter not affecting the merits of the decision upon the matters submitted.

(c) Where the award is imperfect in matter of form not affecting the merits of the controversy.

The order may modify and correct the award, so as to effect the intent thereof and promote justice between the parties."

Advertising the Completed Job

Featuring some copy used by a prominent Philadelphia electrical contractor showing different ways of treating the subject

ONE of the best forms of publicity for a contractor is advertising the completed job There are numerous ways of doing this.

Some contractors take a photograph of every large job they complete and even some of the smaller ones. The photographs are mounted in an album with all the essential data giving names also of the general contractor, owner and architect. With such an album it is easy to show the class of work that one is accustomed to do.

In many cases the contractor on important work takes photographs of some of the conduit runs, switch boards, difficult bends, etc., to show the general ability of the organization.

At times an additional photograph is made to be framed and hung up in the office that all who come in may see it.

Visitors frequently have to wait and while doing so their eyes search out everything. At that time a picture is very interesting to them.

Another important use for these pictures is in making illustrations for use in booklets, on blotters or in periodical advertising.

However, it is not always necessary to use a photograph to advertise a completed job in a periodical, as will be noticed in the accompanying advertisements which were used by W. V. Pangborne & Company of Philadelphia.

Attention is called to the varied type of advertisements that come under this classification. Here we have one large job with emphasis on the fact that it was "completed on time"; one covering the album of completed jobs, one on the work the company had done with automatic telephone installation; another on the jobs completed during the year and one general one on service mentioning the fact that the company had wired some of the largest buildings in Philadelphia.

We Are Glad to Add to Our Large List of Jobs
COMPLETED ON TIME
This Fine New Reading Ferry and Train Terminal
on which we installed the following work:
Complete Underground Duct System.
Cable System with voltages from 26000 to 220.
26000 volt Outdoor Substation and Switching.
High and Low Tension Indoor Switching Equipment.
Entire Battery Charging System.
Lighting and Train Control Cables, etc.
We refer you to the Westinghouse Company who supplied this apparatus to testify to first class manner in which this equipment was installed.
And to the Reading Railroad Engineers as to its durability and lasting quality.
When you are in the market for High or Low Tension Power Work
consult us without obligation
W. V. PANGBORNE & COMPANY
Electrical and Mechanical Constructing Engineers
1927-29 W. Montgomery Avenue, Philadelphia, Pa.
P. A. X. will reduce plant overhead
W. V. Pangborne & Co.
Manufacturers!
Our Accomplishments for 1922
W.V. PANGBORNE & CO.
One of the 100 views from our Album covering work completed
W. V. PANGBORNE & COMPANY
Electrical and Mechanical Construction Engineers

Several examples of how the Pangborne Company uses finished jobs to help them secure future jobs

ASSOCIATION LAYS DOWN DEFINITE TRADE POLICY

(Continued from page 16)

to the industry. From a policy of no set rates or classification electrical contracting is now recognized as one of the less hazardous of the building trades.

While not the originator of the Data Book, Mr. Fowler was largely responsible for its later growth and development. Furthermore Mr. Fowler was one of the first to recognize the need for estimating labor data. His early activities in this connection had much to do with starting the chain of thinking that later led to our present Manuals of Estimating.

Mr. Fowler has been successful in building his business to the point where he is the leading electrical contractor of Memphis. With $1,500 capital he established in 1910, at the age of twenty-seven, the business of Fowler Electric Company. His volume of business now ranges from $150,000 to $250,000 a year.

In the matter of labor he operates open shop with union and non-union men, about equally divided, working side by side. His mechanical force will average around 25 people.

What Other Industries Are Doing On Advertising Resale Price

By H. H. STINSON
Associate Editor, "The Electragist"

IN the merchandising of electrical appliances it has generally been the manufacturer who has fixed the price at which the dealer sells his product. This has been done mainly through advertising direct to the consumer a list price which is supposed to hold good in any part of the country. This does not prevent cut-rate competition but it does establish a maximum list price and automatically limits the markup on the goods, no matter what markup may be dictated by the needs of an individual business. Discounts to the dealer are generally very definitely fixed also, so that he must operate between fixed boundaries.

That this is unfair to the dealer in forcing him to adjust local business conditions to general rules is the testimony of men like John F. Gilchrist, vice president of the Commonwealth Edison Company and also vice president of the N. E. L. A., and of W. R. Herstein, chairman, policy committee, Electrical Supply Jobbers' Association.

The question of how this policy of resale price is regarded and acted upon in industries other than the electrical naturally presents itself. THE ELECTRAGIST in directing an inquiry into the matter has attempted only to find out what other industries are doing so far as resale price is concerned and not to present any definite recommendations. But it may here be said that most of the fields spoken of herein are self-supporting; i. e., they form a unit of business, not a sideline as electrical merchandising does in largest percentage of cases.

HARDWARE

Numerous articles sold through hardware stores are advertised to the public by the manufacturer at a set retail price. But, while there exist no definite figures on the subject, it is estimated that sales of these articles constitute only a small percentage of total business. In this classification come widely-advertised brands of lubricating oil, put up in handy cans for household use, tools such as saws and drills, etc.

The practice of advertising prices to the consumer is very far from being general and the manufacturer is usually content to let the retailer fix his own markup as the needs of his business and the local competitive conditions dictate. This policy seems satisfactory to the retailer.

WE have received so many requests from readers that we investigate other trades to learn how they treat certain practices in distribution which appear very burdensome to the electrical contractor-dealer that months ago we started such an investigation and the first article covering the facts as found appears in this issue. Others will follow regularly.

In presenting these digests of merchandising practice in other fields we give just one word of caution. Do not try to make exact comparisons. They are not fair.

Just as an example, the large department store can pay handsome dividends on 1 to 2 percent. net profits. Imagine how much incentive there would be to an electrical contractor-dealer to receive 1 percent. on a $20,000 merchandise business. The small business must make a greater net than the large business.

In using such facts as are presented be careful not to jump at conclusions. Weigh all facts carefully.—The Editor.

Margins upon which the hardware retailer operates are greatly varied. On some highly fabricated articles, according to officials of trade associations in the field, his margin is as much as 40 percent or more if competition will permit. On the less fabricated articles, such as wire, nails, etc., he works on a close margin. In the case of the latter he buys from a net list and theoretically can markup any percent he wishes. However competition steps in again and prices on these products are usually found on about the same price level in all the hardware stores in the same locality.

The average for 576 retail hardware stores, according to figures collected for 1923 by the National Retail Hardware Association, was 25.19 percent. With this margin to work on an average net profit of 4.12 percent was cleared by these 576 stores.

Less Merchandising Efforts

In order to clear this on a margin of only 25.19 percent, the average operating expense for these stores had to be clipped to 21.07 percent. The hardware dealer can accomplish this because his stock consists mainly of staple articles, requiring no such aggressive merchandising to move as do electrical appliances. For this reason advertising expenditures and the item of salaries to salespeople can be lower than in the electrical store. The overhead of the electrical store handling merchandise exclusively—doing, that is, no contracting business—has been shown to be well over 30 percent and in order to operate as profitably as these figures indicate is an average for the hardware store, the electrical merchant should have a discount on every article he handles of at least 35 percent, which is not the case at present.

In addition the hardware store enjoys as a rule a greater volume of business than the electrical store and therefore a net of 4.12 percent means more actual dollars in profit.

The hardware dealer is primarily a business man and not a technician as the electrical contractor-dealer is and on the surface it might be taken for granted he would be more familiar with the fundamentals of merchandising, such as cost accounting, advertising and aggressive merchandising methods. However the manufacturers do a considerable

amount of missionary work on these subjects. Dealer helps are legion and in general the other factors in the field take the same attitude toward him that the electrical industry has taken toward the electrical retailer; i. e., that it is the fault of his own business methods, not of too small discounts, if he fails to make a fair profit on his business.

This is probably a fairer contention in the hardware field than in the electrical, since the hardware manufacturer generally leaves the question of markup to the judgment of the dealer, while the electrical appliance manufacturer dictates both the price at which the dealer must buy and the amount for which he may sell.

Jewelry

In the jewelry field, practically the only articles sold at a price advertised to the public by the manufacturers are watches and plated silverware. The manufacturer does almost all the market development work on these products through national advertising and the retail jeweler is as a rule, content to accept the business that is brought to him in this way. In other words, his local advertising is more apt to be centered on other articles which are not nationally advertised, than it is on watches and plated ware. Margins on watches vary considerably for the cheaper brands and for the more expensive, running in some instances as high as 45 percent. Gross margin on sales of all articles by jewelry stores is given as 38.3 percent as the average for 290 stores covered by the Harvard School of Business Research survey in 1923. Operating expenses, or overhead, were very high, amounting to 36.4 percent, so that net profit realized was only 1.9 percent. The reason for this extremely high overhead is seen in a total salary and wage item of 17.1 percent and a stock turn of 0.9 times annually. While the electrical retailer can present more favorable figures here, it must be remembered that there is considerable difference between the jeweler's margin of 38.3 percent and the electrical man's of around 30 percent. In other words, the jeweler fixes his own markup so that even though his operating expenses are large, he can still operate profitably. The electrical retailer, on the other hand, must work almost as hard to develop the market as the jeweler, yet cannot adjust his markup to compensate himself for these extra efforts to sell goods.

Hats

Many manufacturers of men's hats in this country advertise their products to the public at a definite price, hats so advertised ranging in price from $5 to $12. Though it is difficult for the public to tell the difference between a $5 hat and a $7 hat, the impression in the trade is that retailers rarely change the list prices in any way. The discounts on such hats range from 30 to 35 percent, the markup given on this basis being from 43 to 54 percent. These figures compare very closely with discounts and markups allowed on electrical appliances. It must be remembered, however, that the electrical retailer's margin must cover the cost of servicing appliances sold on time payments, while the sale of a hat is usually complete in one sales operation. Once the customer has paid over his money and taken the hat from the shop, there is no further expense or time connected with the sale.

Nevertheless, retailing of men's hats, like the retailing of electrical merchandise, has long since ceased to be a specialty and the stores that deal solely in hats, unless they be chain stores, are few and far between. They are handled for the most part by clothing merchants and department stores. It is interesting to learn in connection with the latter type of store, that a number of large department stores refuse to handle brands of hats, prices on which are advertised nationally. They put forward as a reason for this, that a nationally advertised price restricts their merchandising plans. In some cases, they feel they can sell the hats profitably at a lower price than the manufacturer advertises; yet, they do not want to become known as cut price stores. In other cases, they feel the manufacturer's advertised price too low to fit into their selling scheme. Other large stores sell nationally-advertised hats only on condition that their own label be stamped in.

While the primary cause may not be the same in both cases, yet it is interesting to note that hats and electrical appliances, on both of which manufacturers announce a retail price, are sold as side-lines to some other business and do not form independent and self-sustaining units in the retail business world.

Automobile Accessories

In the automotive field almost every manufacturer advertises the retail price of his product to the consumer. This applies both to cars and to accessories, with the exception of technical parts, such as bearings, bushings, etc. The factors that determine this policy are easily understood since both cars and accessories are so thoroughly standardized. The margin allowed dealers on cars ranges from 18 to 25 percent while that on accessories runs up to 40 percent.

Even at discounts which top those on electrical appliances considerably, it has been found hard to operate profitably a store which sells accessories exclusively. There are a number that have succeeded in this, just as there are some successful electrical stores doing only a merchandising business. But in general accessories, are sold through garages, hardware stores, electrical stores and automobile agencies as a sideline. In this way overhead on the accessory line is cut down, just as the operation of a retail electrical business is less costly if it is combined with a contracting department.

In another way retailing automotive accessories is similar to selling electrical appliances to the public. An automobile can run without a bumper or tire chains or a spotlight, just as a home can exist without a vacuum cleaner or toaster or washing machine. Demand must be created before there exists a market to supply and this is a costly process.

Tires

An interesting sidelight on the automotive field was the action of the tire manufacturers several years ago in discontinuing list prices on tires and allowing dealers to determine their own markup. Within the past couple of years, however, there has been a sentiment to reinstate list prices on the ground that the market needs the stabilizing influence of a list price and that a list actually operates to protect the legitimate dealer from the "gyp" dealer. When there is no list it is a simple matter for the "gyp" to advertise cut price sales, when actually his prices are as high as those of the responsible tire dealer.

Discounts would range from 30 to 35 percent if a list were used, giving the dealer a margin about aqual to that of the electrical dealer. However tires are fast becoming staple articles, due to the vast increase in the number of motor cars from year to year and the market needs no such aggressive and costly development as does the electrical market.

The sentiment regarding resale prices

here is outlined in the following statement given THE ELECTRAGIST by an authority in that field:

"One serious effect of the withdrawal of these lists has been that the retailers, on the average, did not know how to establish a profit-producing resale price and as a result are not making the money they should. It has been shown, by an investigation conducted by the Harvard Bureau of Business Research, that the average tire dealer operates on an overhead of 23.3 percent and nets a profit of 1.1 percent on a stock turn of 4.5 times. If the dealer marked up his merchandise to make 30 percent gross, he could make money, but he is too often content with 15 or 20 percent gross."

DRUG STORES

Resale prices in the drug store field have aroused more controversy than in any other except the grocery field. It has centered, however, around the attempts of the manufacturer to prevent "cut rating" rather than any desire of the retailer to secure more margin. In this way it differs totally from the question of margin brought up by the electrical retailer.

It is interesting to note, however, that manufacturers of toilet articles, proprietary medicines, etc., have generally discontinued the practice of printing the retail prices of their products on the outside of the packages. Thus the dealer is left free to determine his own margin.

What his margin is varies considerably. On some articles which the druggist must push himself it may be as high as 60 and 65 percent. On others whose trade names have been so well advertised as to have become household words he will get only 20 to 25 percent.

The Harvard School of Business Research in its survey of 291 drug stores in 1923 gave 35 percent of total sales as the average margin upon which these stores operated.

This is a margin higher than the electrical dealer enjoys on appliances although the druggist as a rule supplies a demand already in existence, does little or no advertising and is a more or less passive sales outlet.

GROCERIES

Some package goods are still marked by the manufacturer with the retail price but the trend here is somewhat similar to that in the drug field, namely to permit the retailer to determine the price at which he will sell his goods to the consumer. Due to the fact that groceries are staples and are sold in units of small price, the electrical appliance field and the grocery field are not strictly comparable, but the above trend in regard to advertised resale price is significant in that the manufacturers once thought it necessary to tell the public it could buy their products at a set price no matter what local retailing conditions were and that now they are getting away from this practice.

Another interesting fact is brought out by the Harvard 1923 figures on 471 grocery stores. These stores had an average margin upon which to operate of only 19.1 percent of total sales and it was found almost impossible to make a profit on this margin unless total sales were $30,000 or over.

This does not mean that stores doing the greatest volume of business had the highest rate of profit, for it was found that stores having total yearly net sales between $100,000 and $149,000 made a net profit of 2.3 percent as against a net profit of 1.9 percent made by stores having an average yearly business of $350,000.

A responsible authority in the grocery field makes the following statement: "The vast majority, in fact the preponderance of retail grocers in this country are desirous of having a fixed price law established, regulating the sale of food products, thus showing the feeling towards specifying a price. The grocery trade does object to publishing a price that is entirely too low, but have no objection to publishing one which shows a reasonable profit."

SHOES

There is practically no advertising of resale price done in this field by the manufacturer, except where manufacturers dispose of their products through their own retail outlets. An average margin for shoe stores is given by figures of the Harvard School of Business Research as 29.1 percent of total sales. This is about the same as the margin upon which the electrical retailer works, but here again it should be remembered that shoes are more or less staple articles and should not require the creative merchandising necessary in selling electrical appliances. Shoe dealers, however, complain that the rapid introduction of styles and the risk involved in supplying the demand for them has compelled them to use more aggressive merchandising methods in the last four or five years than before then. This, in turn, has increased the overhead and added to operating costs, just as creative merchandising does for the electrical business.

Total operating expense for the 499 stores surveyed by the Harvard school in 1923 averaged 27.4 percent of total sales, while that for exclusively merchandising electrical establishments has been proved to be over 30 percent.

COLLARS

An interesting commentary on the subject of margin in the starched-collar field is printed by *Men's Wear*, one of the foremost business papers in the clothing industry. It reads:

"Dealers' indifference to starched collars is generally recognized as the result of the small margin in handling them. It is said that a price of $1.40 a dozen instead of the price of $1.60 would do a lot toward putting the merchant in a receptive mood with regard to new styles that are brought out in starched collars. The retail price is usually $2 per dozen and the markup of 25 percent is not enough to give the retailer any net. . . . ."

The soft collar business, according to the same article, now represents a good 50 percent of the total trade in this line, even taking into account the wide difference in retail prices of the various makes of soft collars. The latter feature, which has enabled the trade to get away from the standardized collar price which formerly prevailed, is one which permits the merchant to make a substantial profit on this business.

FURNITURE

The retailer in this field determines his own margin on practically everything he sells except such standardized articles as kitchen cabinets, etc. As a result he marks up his stock sometimes as much as 150 to 200 percent in the busy months, and then during the February sales and other sales can cut his price to a point where his margin is very small. In this way he evens up his margin for the year. Whether or not this is the best business practice, or whether the furniture business will ultimately get away from the idea of annual sales just as the department stores are said to be giving up the practice of January white sales and other customary sales, is aside from the fact that the furniture dealer has the privilege of making his business flexible to meet local conditions.

A Kit
For the Radio Service Man

THE most important cog in the wheel of radio today is the service man. More and more the radio public is buying results rather than mechanism. It does not care how or why a set runs and whenever anything goes wrong, it is up to the expert trouble shooter to fix it.

"It isn't as hard to sell a set," says J. K. Cronin, general manager of Haynes-Griffin, Inc., one of New York City's largest retailers of radio, "as it is to keep it sold and only good service men can do the latter."

The most important thing to this important factor in the field is his kit of tools. What should he carry so that he can fix practically any set without taking it to the shop or returning there himself to get tools and parts?

In the course of two years of intensive servicing and a close study of service problems, Haynes-Griffin has worked out a kit which meets almost every need of the service man. At the beginning of that period the service men usually left the shop with some tape, a pair of pliers and a screw driver, and the development of the kit has been a natural outgrowth of the experience of the men, themselves, rather than any standard set down by the management. Thus today their kit represents two years of thorough experience with every service problem.

The company employs seven service men, four of them working from automobiles in outlying districts and three of them, on foot, operating in districts near the store. Both the men working from cars and those on foot carry the same kits with the exception of batteries which are too heavy to be transported by hand.

The kit includes the equipment shown in the illustration and listed below.

Tubes cause more trouble than any other part, due partly to the fact that many users have no real knowledge of how to use them and partly to the fact that many bad tubes are sold to those who have no means of testing them. Thus the service man carries a full assortment of tubes and is ready to use them either for testing or for replacement purposes.

It might be said, parenthetically, that all tubes sold by Haynes-Griffin are tested at the shop before they are allowed to go out and are perfect. The company has built a special testing machine for this.

A hydrometer is carried for testing the "A" battery and a combination ampere-meter and voltmeter for testing the "B" battery.

In the metropolitan district a great deal of trouble is experienced by radio users with interference from elevated lines, surface cars, subways and, in the apartment house districts, from sparking elevator motors. To eliminate this noise grid leaks are needed and the kit includes one "Marco" variable grid leak and an assortment of other grid leaks to replace any wrong sizes the owner may have in his set. Oftentimes the grid leak may have been of the right size when the set was operated first but in the meantime the tubes may have become less efficient and a different size grid leak may now be required.

Owners often "monkey" with their sets before calling in the service man and in the kit there is an assortment of nuts, bolts, etc., to replace any that may have been lost by the "handy man" of the house.

There is also carried an assortment of fixed condensers to "pep" up the set that has developed general anaemia.

Pliers, screwdriver and knife still form the nucleus of the kit as they did at the very beginning and in addition there is a clawhammer which is handy in a dozen different ways. A pair of headphones and a phone plug are carried for testing purposes.

The antenna equipment in the kit is complete. It includes lightning arresters, insulators and knobs, antenna, lead-in and ground clamp. There is also an electric soldering iron, solder, paste, and tape for connections.

Two colors of wire, white and brown, are in the kit for inside wiring.

The men carry the kit in an ordinary brief case. In the beginning tin boxes were supplied to them but these were discarded when it was found what a high type of man was needed for service work and the brief case was adopted as giving more dignity to the men who are really "super-salesmen."

IN THIS KIT ARE

- **Two UV 201A tubes.**
- **Two UV 199 tubes.**
- **One UV 200 tube.**
- **One Hydrometer.**
- **One combination ampere-meter and voltmeter.**
- **One "Marco" variable grid leak.**
- **Assortment of grid leaks.**
- **Assortment of screws, nuts, bolts.**
- **Assortment of fixed condensers.**
- **Pliers, screwdriver and knife.**
- **Headphones and phone plug.**
- **Clawhammer.**
- **Antenna equipment, complete, including lightning arrester, insulators and knobs, antenna, lead-in and ground clamp.**
- **Set of special wrenches for "Garod" neutrodyne.**
- **One electric soldering iron, solder, paste and tape.**

(EDITOR'S NOTE.—Haynes-Griffin, Inc., have studied radio service problems both extensively and intensively and a later article will discuss their service policy.)

Robinson Sells Beauty First, Fixtures Second

Until Three Years Ago Discriminating Builders in Central North Carolina Went to New York for Lighting Fixtures—But Today—

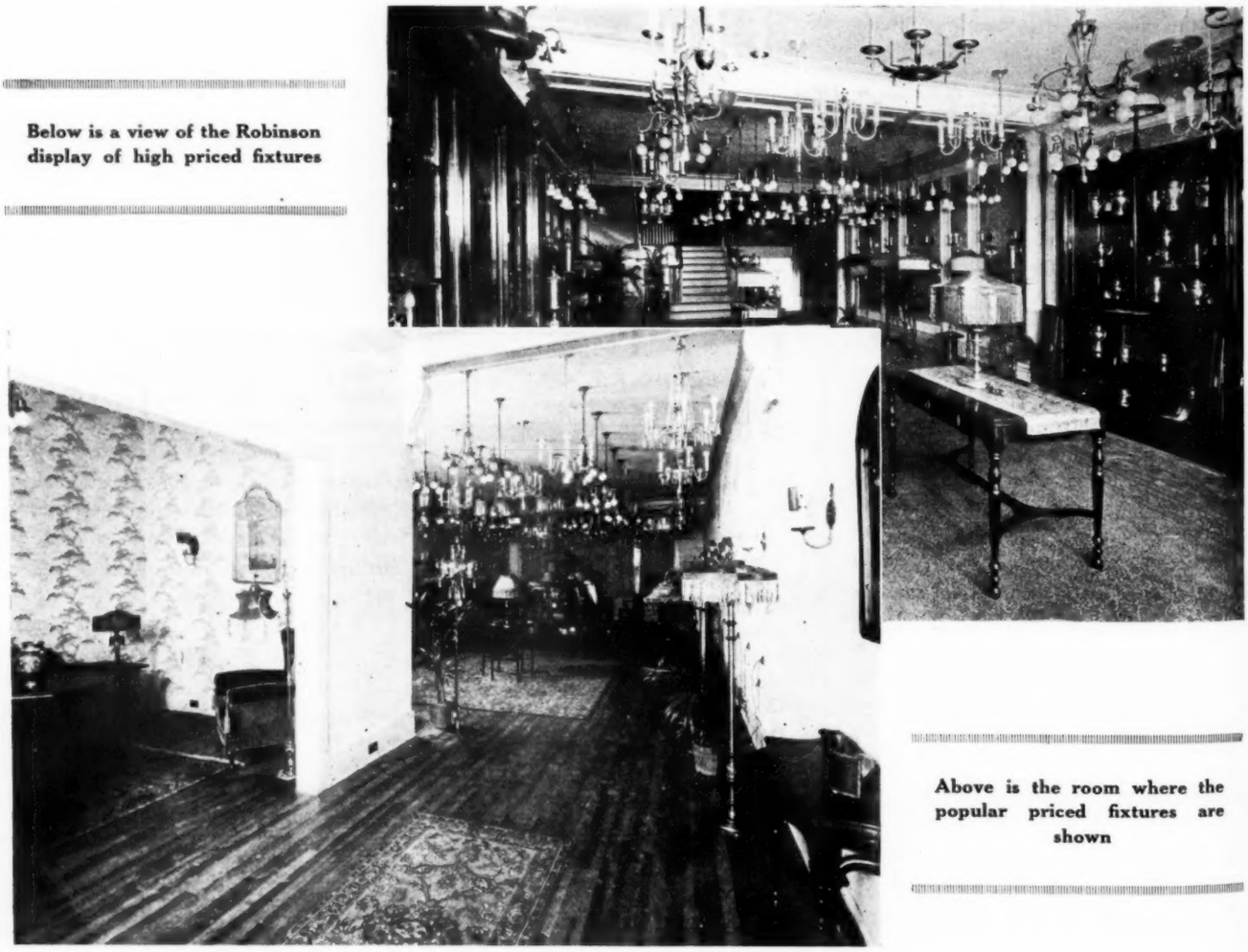
By RUEL McDANIEL

RECENTLY in a town some 50 miles from Charlotte, North Carolina, the Masonic lodge erected a temple, distinguished for its beauty of design and carefully finished interior. When the building neared completion those responsible for its erection sent out requests for bids on the furnishing and installation of the electric light fixtures.

Bids went in from several surrounding towns and cities. There was a wide variance in price, for the job was a rather large one. There was one bid that stood out from all the others for two or three good reasons. One was that it was some $250 higher than any of the others. That was the bid of F. E. Robinson & Company, Charlotte; and it was the one finally accepted.

No "wire-pulling" or friendship angle figured in the awarding of the contract in any manner. Each bidder stood on his own resources. The reason the Robinson bid was accepted, even though considerably higher than the next one, was because it provided the temple with the sort of lighting fixtures that it needed to conform with the interior of the building.

It was constructed throughout in Egyptian style of architecture. Being given a chance to bid on the job, F. E. Robinson & Company called in the salesman for the concern which manufactures the best type of fixtures the company carries and told him what was wanted. This salesman happens to be somewhat of an artist, so he and the Robinsons together drew up some fix-



Below is a view of the Robinson display of high priced fixtures

Above is the room where the popular priced fixtures are shown

ture designs that were appropriate to the design of the temple. These were forwarded to the factory, with a request that more finished drawings be made and sent back at once. They came, beautiful and admirably fitted for the Egyptian interior of the building.

They were forwarded to those in authority, along with the bid. At once the designs showed the advantages of installing really fine, specially designed fixtures. After seeing these drawings, it appeared to the trustees that anything less appropriate would be rather out of the question. The suggestions got Robinson the job.

A Quality Fixture Business

This is one of many instances in which this company has won out, for the reason that the owners have determined to get the quality fixtures business in Central North Carolina and have provided adequate means of carrying out that determination.

"Until three years ago," declared R. W. Robinson, a member of the firm, "when people wanted specially designed, really high class fixtures for homes or carefully designed public buildings, they got on the train, went to New York and, together with the designers of some large fixture concern, worked out the fixture plans and placed the order.

"We believed that, if properly managed, this business could be diverted to channels nearer home. We set out to try and win this type of fixture business. Prior to this time we sold fixtures; but they were little or no different than the usual line to be found in any medium-sized electrical store that sold fixtures. For supplying the small homes, commercial buildings and the like, our stock was as good as that of anyone; but, like many others in the contracting field, we weren't there with the high quality, specially designed stuff."

Selling From Designs

The company began by stocking a small line of high-priced fixtures, but it didn't stock too heavily with this class of goods. It relied upon selling from designs, rather than from actual showing of the merchandise. And although a larger stock of quality fixtures are carried today, the company's ability to sell by design and special order is one of the most valuable assets in selling better grade fixtures.

"We depend upon our manufacturers for a great deal of cooperation in selling this class of goods," said Mr. Robinson. "When we learn of a building under construction that should have specially designed fixtures, we call in the salesman for the manufacturer from whom we buy most of our personally designed stuff and, with him, study the building and work out a design that will conform to the general architectural and decorative scheme. We forward this to the manufacturer, who in turn draws up more complete layouts and sends them back to us for presentation to the owners of the buildings.

"By working in this way we have been successful in getting the fixture contracts for a number of large churches, lodges and expensive homes that otherwise we never could have touched," Mr. Robinson explained.

Getting leads for this class of sale is not so difficult as in the smaller job. The announcement of the building of a public structure or a large home always attracts newspaper notice. This gives the company the lead, even before the foundation is laid, in many instances.

Co-operation of Contractors

But when this source fails, the contractors are always relied upon for supplying data on structures worthy of high-priced fixtures. Securing this cooperation from contractors, of course, is a matter of personality and a willingness to work with the contractors wherever possible. In the actual sale of the fixtures, the company invariably goes directly to the person or persons responsible for the erection of the building; for, as Mr. Robinson said, where fixtures are specified at all in the contract, usually there is not a sufficient amount allowed for the purchase of the right kind of fixtures. That is why there is no use depending directly upon the contractor and architect for securing the fixture contract.

The company now employs a special investigator who spends the greater part of his time following up leads and finding new ones for quality fixture installations. He covers several counties around Charlotte in addition to the city itself. The fixtures business of the concern runs between $60,000 and $75,000 a year, and the greater portion of this is the same class that went to New York and other large cities until three years ago. The company does a general electrical contracting business in addition to the fixture sales and installation.

The company felt that taking on the quality line of fixtures was no reason for dropping the more popular-priced lines—disregarding the principal fixture trade it had had in the past. So provisions were made in the new building for taking care of both classes of patronage satisfactorily. The popular-priced lines are bought principally in the store; the more exclusive designs are sold from drawings in the office or in many cases the home of the prospect.

Showroom Location

So it is only reasonable that the company has installed its showroom for popular-priced fixtures on the first floor, in the most prominent location, even though the other class means more volume and profit. Here customers may be shown the patterns most commonly in demand and they may make their selections from stock.

On the second floor of the store is a room devoted exclusively to the display of the higher-priced lines, some of which are especially designed. On this floor, also, is a room, about 12 feet square, which serves as a means of making special displays. From a furniture store next door the company borrows whatever furniture is needed to transform the room into parlor, kitchen, dining room, living room or library—whatever layout the company wishes to depict. Fixtures then are hung to match the room. About every week or ten days the display is changed—switched from living room to dining room or parlor, or vice versa. It aids considerably in selling, the company finds, to be able to show this type of fixture in its natural setting.

Guaging the Prospect

"We always try to ascertain about how much money a person has to spend for fixtures," said Mr. Robinson, "before we lead him or her to either display. If the fixtures are for a bungalow that costs only four or five thousand dollars, we know that the owner doesn't want to spend a great deal for fixtures. We show him our popular-priced room. He is able to select some of the most beautiful designs there, even on his small fixture allowance, and he goes away satisfied. But if he were to see the other room, with the fifty and hundred dollar types, he would not be satisfied with the cheaper ones. He would walk out, dissatisfied, without buying either."

The company has still another room for displaying smaller fixtures—porch lamps, wall brackets, and the like, where both expensive and popular-priced goods are carried.

Radio Service Hints

The day of the radio fan is fast going by and the great public with no knowledge of radio or desire to know is buying sets. This is increasing the need for service and as a service to the electrical contractor this department is started. Here will be found each month a few short hints on trouble detection, prevention and removal.—The Editor.

Defective Tubes

If a vote were taken on what part of a radio set causes the most trouble the radio service man would probably cast his ballot for tubes. One service man's customer called him in and explained that his set had worked all right until he got a new set of "A" batteries. As soon as they were connected the owner could get the filaments to burn brightly when he turned on the rheostat but he failed to get any volume. Before he called in the service man he even purchased a new set of B batteries but still could not get good results. He blamed it on the batteries, never suspecting that it might have been the tubes since they burned brightly. However the service man found that the G and P terminals of the tubes were dirty and furthermore that they were not making perfect contact. He showed the customer that it was possible also to insert a tube in a socket so that both filament terminals would have contact, but still have an open in either the grid or plate terminals. Unless there are broken connections in the set the service man can rest assured that such trouble will be discovered in tubes or sockets and a new tube tried in the various sockets should reveal the faulty tube. The service man can often make a sale of an extra tube by telling the fan he ought to have one handy to use for testing purposes.

An Unsuspected Cause of Trouble

The owner of a set who lived in an apartment house was having considerable trouble with his outfit which should have given him the best of results. Every few minutes the set picked up a very bad crackling sound that distorted reception. The service man was called in and performed the following operations: Removed the ground and installed a counterpoise; inserted fixed condenser in the antenna; inserted fixed condenser in the original ground; used a cold water pipe instead of the steam radiator pipe; inserted fixed condenser in both aerial and ground; changed tubes around and tried new batteries. But the results were the same—the noise continued. Then he began to look around for external conditions that might be the cause and this is what he found. The trouble was due to sparking brushes on the motor which operated the elevator in the building. The matter was taken up with the superintendent of the building and the brushes were removed, cleaned and resurfaced to fit snugly the commutator of the motor, which was also cleaned with a little kerosene. The noise stopped, but to make the cure doubly sure the service man also grounded the frame of the motor.

The Importance of Aerials

One of the most prolific sources of trouble, next to tubes, is the aerial. When a loop aerial is installed for a customer it should be remembered that if this loop is near electric lights, electric light wires or any electrical appliance it will pick up a humming noise, the A. C. hum with which every electrician is familiar.

Antenna trouble is particularly prevalent in the cities where there are apt to be ten or twelve separate aerials to each apartment roof and where apartments are often shaped so that there is little choice of the direction in which the aerial may be strung. One instance of this came to light recently.

A customer who lived on Riverside Drive, New York City, had an aerial on the roof of a fourteen-story apartment building. The aerial itself was 75 feet long and the lead-in totaled 90 ft. The ground was attached to the radiator. The fan got fairly good results with Western stations but found two faults with his set. One was that he could not pick up Northern or Southern stations and the other that the tuning was so broad at times that the set was practically non-selective. The service man installed an indoor aerial consisting of about eighty feet of talking tape to use as a counterpoise which did away with some of the broadness of the tuning. He also judged that the length of the receiving system was too great to obtain selective tuning. This he decreased in two ways, first by inserting a small fixed condenser in series with the lead-in. The smaller the capacity of this condenser the greater is the reduction in wave length. The second method was by reducing the length of the antenna from 165 feet to 130 feet. It has been found that the ideal length for antenna in the country is 150 feet but in crowded localities the antenna and lead-in, if possible, should not be over 100 feet. This is not always possible when the set is located on one of the lower floors of a tall apartment building and the antenna is on the roof, in which case installing the fixed condenser in the lead-in will help. To solve the problem of picking up northern and southern stations as well as Western the service man on this job restrung the aerial so that it ran northeast and southwest which enabled it to pick up all of the New England stations.

Changing the Solution

Customers should be told that the solution in an alkiline battery needs changing only about once a year. If the owner is to do it himself, he should be advised to be careful in mixing the solution. The potassium hydrate should be slowly poured into an earthen crock containing cold distilled water and stirred until the solution is cold. The action between the potassium hydrate and water generates heat and the earthen crock is suggested to prevent cracking. The electrolyte solution containing about one part of potassium hydrate to four of distilled water. When fully charged each cell should have a potential of 1.4 volts and when in use should drop to 1.2 volts.

James F. Burns, Schenectady

The letterhead of the James F. Burns Electrical Works says "Established in 1890," but this is only part of the story. For in September of this year the head of that firm will round out his forty-fourth year in the industry. Mr. Burns was born Sept. 19, 1869, and lost little time in starting off to make his long record of unbroken years in the electrical business. He took his first job in 1881, when he was only 12 years old. The telephone was still an infant industry then and perhaps the common quality of youthfulness drew them together. At any rate his first duties were as messenger boy for the telephone company just getting a start in Schenectady. Inside of a year he had been put to installing telephones. Five years later he left the telephone company to work as an employe of the Edison company which had just established about that time the modest plant which has since become the gigantic works of the General Electric Company. In 1889 he switched his allegiance to the Illuminating Company of Schenectady. There he remained for only a year and in 1890 went into business for himself, a business which is now completing its thirty-fifth successful year. The business employs an average of about thirty people at the present time and the company does a jobbing as well as a contracting and retailing business. Mr. Burns was one of the first members of the Association of Electragists, International, having been a member of the Schenectady group which later joined with other locals to form a state association. After this came a national association with the New York association as a nucleus. Thus he has seen the organization grow from independent groups of contractors in a few cities to an international body with members in five countries. He has held various offices in both state and national for many years.

Electragists You Should Know

William S. Samuel, Baltimore

By all rights of birth, training, aptitude and personal leanings, William S. Samuel belongs where he is, in the electrical contracting field. His earliest recollections are of the electrical business for his father, the late Herman Samuel, was one of the founders of Kingsbury, Samuel & Company, which is among the oldest electrical firms in the country. Mr. Samuel was born in Baltimore in 1885 and in 1898, when he was thirteen years old, began his career in the contracting business. He started to work as a stock clerk and office boy for his father's firm. While he was so employed he found time to complete his education, attending first the Baltimore Polytechnic Institute from which he graduated in 1902. From there he went to the Maryland Institute of Art and Design, from which he received his degree in 1904. Following this he went into the business in earnest, gradually advancing from one job to another, so that it can be said he knows electrical contracting from top to bottom. In 1912 his father died and at that time he assumed the office of president and general manager, an office which he still holds. At the present time he is conducting, with his brother, Albert H. Samuel, a contracting business that is known not only in Maryland but in surrounding states for the quality of the personal service that both members of the firm put into its work. He has long been interested in organization work, being one of the pioneer members of the Association of Electragists, International. He also belongs to the Union Section of the A. E. I., to the Institute of Electrical Contractors of Maryland and to the Builders' Exchange of Baltimore.

The Electragist

Official Journal of the
Association of Electragists—International

S. B. WILLIAMS
Editor

H. H. STINSON
Associate Editor

Time Payment Merchandising

There seems to be a growing tendency on the part of central stations to sell almost everything on the dollar-down, dollar-a-month basis without charging any financing cost.

Where this policy is being followed vigorously it is resulting in drawing the business away from other retail outlets. The non-electrical stores to compete are offering cheaper and poorer lines. The electrical stores find it very difficult to compete in the town of average size.

Such a policy by the light company is decidedly short sighted. Its own merchandise sales will increase but its appliance load will not and cannot increase as fast.

The light company takes a loss on its merchandising thereby demonstrating conclusively that it is interested only in building the load. An aggressive partial payment policy will defeat the very thing most desired. Records will prove it.

One Cause of High Overhead

It was a quarter past nine in the morning—the shop opened at eight—and still there were wiremen hanging around. There was plenty of work to be done but the boss had not yet gotten around to tell them what to do.

Here was lost time and plenty of it. Who paid for it? Certainly not a customer.

This lost time is a great money eater. It can be stopped if the boss or his foreman will lay out each day the work that is to be done the next.

Every morning each man should know as soon as he arrives for work just what he is to do. Workmen's wages are the most expensive thing in the business; but if used properly they are the most productive. There can be no profit if the men are not working. Why then should we permit a moment of their time to be spent sitting around the shop waiting for some one to find the time to tell them what to do.

The Time Traveling Salesmen Take

One of the big losses of contractors and dealers is the time taken up by manufacturers' salesmen thoughtlessly. Salesmen are a part of the business and they can be of a lot of assistance to their customers and prospective customers—and they can be pretty much of a nuisance.

The average contractor and dealer is a busy man and it is unfair to waste his time with irrelevant talk. If more contractors and dealers were bothered less in this way, they would have more time to devote to their business and make some money.

Where this situation has become acute contractors and dealers may find it necessary to limit the time for seeing these representatives of the manufacturers. Such a policy will have the effect, not only of saving time, but of keeping salesmen to the point.

Contractors should never refuse to see a salesman; because he might be of assistance. However, when convinced that you do not want to buy insist on closing the interview. To ask him to go is no act of discourtesy—you are simply asking him to take no more of your most valuable possession—time.

Green Grass on the Other Side of the Fence

Every now and then we hear of a contractor who is apparently well off who says "Yes, I've made some money, but I didn't make it in the electrical business."

Such an instance came up the other day and we proceeded to investigate. The invested capital was $16,500 and the net profits of the business were in excess of $13,000 or roughly 80 percent per annum. It is true that on the volume of business done the net profit was but 10 percent.

Where, however, can one make a better profit on one's investment than 80 percent?

One may have a real estate deal, or may speculate in securities and make a handsome profit; but that is a happy instance and not regular. If the capital tied up in such ventures were kept in the business the chances are that the same profit would be earned and next year as well.

Stop for a minute and consider your investment. Compare the net profit with it and then say whether or not it pays to be like the horse who always thought the grass on the other side of the fence was greener—with the result that he never enjoyed the grass in his own lot.

Rent Versus Stock

One of the curses of the small contractor is the quantity discount, particularly on conduit. Too many are buying in

large quantities for stock because of the extra discount. Even supposing the stock is moved in thirty to sixty days it will generally be found to be more expensive than smaller purchases especially when there is a jobber near by.

Large shipments mean storage space and as this is at the same place as the office it means large rent.

The saving in additional discounts is more than offset as a rule by the higher expense caused by additional capital required and the higher rent. There are times, of course, where shipping conditions are unsatisfactory and where a stock is necessary to meet immediate demands. Also there are businesses where the turnover is attractive enough to warrant the large stock.

Generally speaking, however, the smaller contractor will do well to limit his stock and keep his rent small and his capital free.

Radio Necessary for the Electric Store

The electrical store needs something to attract customers, according to a prominent contractor-dealer, and in his opinion radio is to the contractor-dealer a necessity because it draws attention.

Many electrical stores have been less warm toward radio recently because it takes so long to sell it. The average customer will spend two to three times as long buying a radio set as he will buying anything else of equal cost.

Nevertheless if radio will bring people into the store, people who can be interested in something else as well, it may easily compensate for its drawbacks.

The drug stores have capitalized on the idea of carrying lines to attract people, until now we find drug stores carrying everything but drugs.

This of course is going a bit far; but radio is essentially electrical. More and more it has to be installed. It would seem to be admirably fitted to the electrical business.

Repairing Appliances Sold by Others

The sale of dollar-ninety-eight cent perculators and eighty-nine cent curling irons and other such cheap trash by non-electrical stores is reported as falling off.

Some of the other slightly more expensive, but not much better electrical merchandise sold by the drug store, hardware store and other non-electrical outlets would move in less volume if more contractor-dealers were to take up the policy of one man who refuses to repair any make of appliance which he does not handle.

The strongest selling point of the electrical dealer is that he handles quality merchandise and is willing to service it when necessary. Why should he not impress this upon the public by insisting that the public get that same service from the hardware, department and drug stores?

These non-electrical outlets are able to sell electrical appliances at a much greater profit than the electrical dealer because they do not have any service cost. If they had to absorb a service charge they would not be so eager to handle electrical appliances at the present margins.

It has been frequently stated that the non-electrical outlets could sell appliances and make a profit although the electrical dealer was claiming that the margin was inadequate. Maybe the electrical dealer could make a profit if he didn't stand back of his merchandise and give service when demanded.

There are those who might say that the electrical man should make the repairs on appliances sold by others; but how often can he make these repairs profitably? If he charged his cost, overhead and profit the customer would in many cases feel robbed and the dealer would make an enemy for himself.

Refusal to make repairs on goods sold by non-electrical stores might also apply against items sold direct by the manufacturers at or under the dealer's cost.

Unarmored Assemblies

There is general disappointment over the way the Electrical Committee in the recent code revision meeting left the matter of unarmored twin and multiple assemblies.

For a year such products will not be included in the National Electrical Code but unfortunately there is nothing to deter local inspectors, underwriters or others, from approving installations made with such material.

The wording of the resolution returning the matter to Article 5 Committee is not clear but we trust that neither Underwriters Laboratories nor anyone else will take advantage of the method of expression of an idea, the spirit of which was never for a moment in doubt.

Unfortunately the unarmored built-up assembly has received a favorable vote from many who have taken things for granted. It is always easier to vote YES to anything, because that is the line of least resistance. It takes thought and courage to vote NO.

The thinkers of the electrical contracting industry are opposed to such assemblies and their vote is NO.

To Keep an Organization Together at a Profit

In some parts of the country building is slacking off. Is that going to be the signal for a number of electrical contractors to begin to pay the price of holding an organization together? We sometimes wonder if an organization is worth the price we pay to keep it during slow times.

Too few have learned of that tremendous store house of work—the wiring of already wired buildings. Before a building has been wired five years there is room for additional wiring. Our standards are advancing rapidly.

Just to prove that this work exists we suggest that it be tried out in every building which was wired ten years or more ago. A survey will show what there is to be done and where the greatest volume of work exists.

Association of Electragists INTERNATIONAL

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118 Monroe Ave., Memphis, Tenn.

SECRETARY AND TREASURER, Laurence W. Davis,
15 West 37th Street, New York City.

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(C) designates exclusively Contractor-Dealer organization.
(L) designates an Electrical League.

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MARCH ACTIVITIES

Florida Association Adopts New Constitution and By-Laws

A new constitutiton and by-laws which are somewhat unique for state associations were adopted by the Florida Association of Electragists at its annual meeting held in Orlando on February 26. Patterned after the Constitution of the United States it gives to the membership the right to vote for officers and the right of complete expression of opinion but it vests in the executive committee the entire responsibility for the activities of the association.

At the election Preston Ayers of Orlando and Charles E. James of Fort Pierce were chosen to succeed themselves as president and secretary, the former for two years and the latter for one year. The following were elected to the executive committee. T. A. Brown, St. Petersburg, three years; E. A. Robinson, Miami, two years; and T. E. Satchwell of Jacksonville, one year.

At the morning session there was considerable discussion relative to an All-Metal State and it was later learned that at least two important Florida cities would in all probability have an All-Metal Code shortly.

A uniform State inspection was suggested and discussed. No action was taken but the executive committee is giving attention to it.

Another matter which was brought to the attention of the executive committee was the sale of unapproved electrical materials by non-electrical stores. The contractors, it was pointed out, are permitted to install only approved materials when there is inspection but the non-electrical stores sell to those who never secure inspection.

The Florida electrical inspectors met at the same time with H. M. Lang of Orlando as presiding officer. He was also elected secretary of that group to act with the Florida Association of Electragists.

The inspectors passed a resolution disapproving of all built up assemblies. They also suggested a poll of the towns as to what in their opinion would be the best kind of ordinance, the majority opinion to be submitted for adoption by the state.

Among those who addressed the inspectors were Mr. Schoer of Atlanta, Mr. Lang of Orlando and Mr. Peyinghause of Tampa.

At the close of the morning session the Orlando electragists served a box luncheon.

Both groups came together in the afternoon to listen to addresses on problems of national importance.

Charles F. Dowd gave an interesting and enlightening talk on "Merchandising and Advertising." He was followed by George A. Hughes, president of the Edison Electric Appliance Company who under the topic of "Merchandising Problems" stressed the necessity for co-operation.

A. M. Ferry, secretary of the Electrical Porcelain Manufacturers Association explained the purposes and aims of his association.

Mr. Schoer of the Southeastern District of the Underwriters, spoke of the National Electrical Code and its revisio and urged better grounding in Florida.

"Cable Specifications" was the subject handled by Miss F. H. Pettee of the Simplex Wire & Cable Company. She pointed out the necessity of getting proper cable to withstand the local climatic conditions.

All Metal and other National Association policies were outlined and explained by S. B. Williams, editor of THE ELECTRAGIST.

The afternoon session concluded with an address by O. C. Small of the Society for Electrical Development on the Red Seal Plan.

In the evening a banquet was held at the Hotel Angebilt to which one hundred and ten sat down, following which there was entertainment furnished by the Orlando Association.

N. F. P. A. Convention Plans

Definite plans for holding the twenty-ninth annual convention of the National Fire Protection Association at Chicago, May 12, 13 and 14, are now being made. The headquarters will be at the Congress Hotel, where all sessions will be held. Registration will start on May 11.

Here is a sample of the large attendance that the Florida electragists can at

Wisconsin Inspectors Discuss State Licensing

The subject of state licensing for electrical contractors came up before the meeting of the Wisconsin Chapter of Electrical Inspectors, held in Milwaukee recently, and the merits of the plan were discussed by C. W. Babcock, city attorney of Milwaukee. The Milwaukee ordinance covering this matter is now before the United States Supreme Court and provides for the licensing of electrical contractors who employ a supervisor of five years' experience. The advantages of uniform inspection ordinances for all communities of the state were emphasized.

In an address on "The Code, the Inspector, the Executive," Frank Frey, Jr., Geuder, Paeschke & Frey Company, defended the code as a guide to best practice based on experience. Inspectors by intelligent application of the code to a given job may help the contractor to improve his next installation.

Effective and practicable forms of publicity for electrical inspectors were described by W. S. Boyd, secretary, Western Association of Electrical Inspectors. Use of the daily and weekly press was urged as a means of telling the public of the motives and organizations behind the electrical code. Sections of the code applying to fire and safety are more effectively explained by emphasis on the convenience, comfort and economy resulting from compliance. Interesting methods used by various inspectors for impressing the importance of sealed main fuses were reported by Mr. Boyd. The sealed main fuse was urged as the best protection against the two greatest hazards of electric wiring —which are the looping or kinking of wires and "doctoring" of fuses.

The wiring methods committee urged the importance of considering all wires as bare. Pressed-steel fittings were condemned for damp places. Galvanized conduit was called superior to black pipe because of its greater resistance to corrosion and better conductivity at joints. The use of approved anchors instead of wooden plugs was urged for fastening conduit to masonry walls.

Compliance with the maximum regulations of states such as Wisconsin was suggested as a means of enabling manufacturers to have their products accepted elsewhere. The success of these maximum regulations would, it was maintained, ultimately raise the requirements in other localities.

Officers elected for 1925 were: President, Raymond Schleck, South Milwaukee; vice president, Pearl S. Bixby, Oshkosh; secretary, A. C. Schultz, Milwaukee.

Lehigh Valley Association Appoints Committees

The regular monthly dinner meeting of the Lehigh Valley Electrical Association, Inc., was held on Feb. 26 at Bethlehem, Pa., with an attendance of forty members. E. W. Weaver, of Allentown, Pa., president, presided, and Mayor Yeakle of Bethlehem was guest of honor.

The following committees were named at the meeting:

Code of ethics, A. S. Mertz, A. W. Hill and William Solliday; membership, Paul Odenheimer, William Willenbecker, A. W. Hill, R. Walker, W. R. Litzenberger, W. F. Kleppinger, W. H. Bonsen, R. G. Fulmer, J. E. Hauch, R. H. Bauchsbien, A. Englehart, Russell White, E. Emsley and F. J. Ashman; public service, A. S. Weibel, Charles Crowder, R. W. Keck, F. K. Fogel, W. R. Litzenberger, A. W. Hill, Russell White, E. Emsley, A. Englehart, R. H. Bauchsbien, O. S. Mertz, R. J. Morrison and Robert Huether.

Move For Year-Round Building Meets Support

The movement to increase the amount of winter construction is being pushed with vigor by local groups of business men and others connected with the building industry, according to a report to Secretary Hoover from Dr. John M. Gries, Chief of Commerce Department's housing division. Business men all over the country are aroused to the importance of stabilizing the building industry. Their activities are directed toward investigating local conditions in their communities and planning their future construction accordingly. Such activities are the keystone of the program for lengthening the construction season.

In Cleveland, Ohio, the Chamber of Commerce, the Builders' Exchange, and the Board of Lumber Dealers have appointed committees to study local building conditions and to devise effective methods for correcting the seasonal ups and downs. In Wilmington, Delaware, the Chamber of Commerce has condensed the arguments for a longer building season into a pamphlet which has been widely circulated. In Omaha, Nebr., the Builders' Exchange has given publicity to the subject through newspaper advertising. The St. Louis Master Builders' Association has done likewise.

The New York Building Congress, a pioneer in the winter construction movement has made a thorough study of the

their state meetings. This picture was taken at the recent Orlando meeting.

prospects for winter work in New York and has issued a report which predicts considerable activity in the winter months. Recent experience, the report says, "Very nearly establishes a new normal seasonal distribution of building volume."

The Philadelphia Building Congress, also one of the first to advocate winter work, has devoted much space to the subject in its publications and in the newspapers. In Chicago a long list of buildings is now under construction. The total valuation of contracts awarded for December in that city was well above the same month of 1923, due to the confidence aroused in winter building by local organizations. These instances are evidence of a widespread feeling that business in general has much to gain from more stable conditions in the building industry.

Several cities have already undertaken studies of local weather conditions, similar to the investigation made by the Department of Commerce in nine construction centers. Through these studies it is proposed to obtain from weather records the facts as to average and extreme weather conditions so that builders may have a basis on which to figure probable delays due to winter conditions. The Akron Builders' Exchange has arranged to cooperate with the Engineering College of the City of Akron for weather studies and the chapter of the Associated General Contractors in Los Angeles is undertaking similar work.

Lighting Sales Campaign in Cleveland

A campaign that will result, it is hoped, in the sale of $2,000,000 worth of lighting fixtures in the Cleveland area will soon be put under way by the lighting section committee of the Electrical League of Cleveland. The program provides for the participation of dealers, and of manufacturers of fixtures, glassware and lamps. It aims at the marketing of lighting equipment through the dealer to the home owner.

Over 10,000 prospects will be circularized by direct mail and a plan for financing these sales is ready.

A program to boost sales of commercial lighting equipment has been drawn up at a meeting of the lighting section committee held recently. The mailing list in this campaign will include approximately fifteen hundred names.

Standard Purchase Forms Considered by Electrical Credit Men

The movement to standardize purchase order forms, as recommended by the National Association of Purchasing Agents and the Department of Commerce, met with favor at a recent meeting in Chicago of the Central Division, National Electrical Credit Association. Emphasis was placed at this meeting on the importance and feasibility of early adoption of standard forms for purchase orders, to be followed later by the adoption of the standard zone system as advocated by the Department of Commerce.

Information on Small Rectifiers

A publication dealing with the theory and performance of small rectifiers has recently been issued by the Bureau of Standards, Department of Commerce. Such rectifiers have come into extensive use in recent years for the charging of radio batteries and other small batteries, and for the charging of larger batteries where a low charging rate is used, this being known as "trickle charging."

Date for 1925 Convention Now Definitely Set

The 1925 annual convention of the Association of Electragists, International, will start on Sept. 23 and run through until the noon of Sept. 25. This was the final decision of the executive committee of the association at its meeting in New York this month. A meeting of the executive committee will be held on Sept. 22 and the first business session of the convention will take place the following morning. West Baden, Ind., where the 1924 gathering was held, again will be the scene of the convention.

The business sessions this year are to be shortened for the benefit of those members whose work needs their personal supervision and who cannot take a whole week away from it. Both morning and afternoon of Sept. 23 and 24 and the forenoon of Sept. 25 will be devoted to the business of the meeting.

Recreational features, however, will not be lacking for those who wish to take advantage of them. While no definite sports program has been arranged yet it is probable that something of this sort will be scheduled for the afternoon of Sept. 25 and for Sept. 26, which falls on Saturday.

The golf courses which proved so attractive to delegates last year will again be open to them. In addition, the lower course, between the hotel and the station, which last year was in process of building, will be ready for play this year. This will eliminate the long climb to the upper or "Rocky Mountain Goat" course, which, however, will still be open to those wishing to play it. The tennis courts, bowling alleys, baseball field, and No. 7 Spring will be available to all as they were last year.

It is probable that the evening sessions will be dropped this year and that such entertainment as dances, card playing, music and motion pictures will be available on the two nights of the convention.

Another manufacturers' exhibit in the Pompeiian Room is now being arranged for. Several of last year's exhibitors have already made their reservations for 1925 and an exhibit fully as comprehensive and educational as the 1924 show is assured.

As reported in THE ELECTRAGIST several months ago the convention will be held simultaneously with that of the Great Lakes Division of the National Electric Light Association, which convenes at French Lick. This resort is only one short mile from West Baden and there will be an opportunity therefore for the delegates of both conventions to get a new viewpoint on each other's problems and policies. At a later meeting of the executive committee arrangements may be perfected whereby each convention will have a special session which the delegates to the other will be invited to attend.

Insurance Company Distributes Electrical Poster

A poster, 22 in. x 30 in., containing a message on the danger of householders doctoring up their electrical equipment, is soon to be distributed to members of the A. E. I. by the Insurance Company of North America.

Uniform Code Interpretation Urged on Eastern Inspectors

The need of uniform wiring code interpretations was urged before the meeting of the Eastern Association of Electrical Inspectors at Hartford, Conn., Feb. 23, by Gov. J. H. Trumbull of Connecticut. Gov. Trumbull, who is head of the electrical manufacturing company bearing his name, spoke of the economic waste of multiplex ordinances in this field.

"Now, does it seem reasonable," he asked, "that a house in the city needs a safer wiring installation than a home in the country? Would you think Seattle needed rules affecting wires in damp places that would not also apply in New Orleans or Boston? No, it is possible to make a common and universal rule for each detail. Moisture is wet anywhere, lightning is destructive everywhere, and if a No. 8 wire will safely carry the current in one place, it will carry the same current in every other place.

"According to some of the local rulings in various parts of the country, however, it would seem that electricity differs in character according to the locality in which it is distributed. I know there are direct current and alternating current and all kinds of voltages, cycles and phases, but why is it still necessary to use No. 6 wire for a ground connection in some places when No. 8 has been permitted by the code for the past two years? Surely both cannot be right under the same conditions. Why is an identified wiring system mandatory in progressive localities, while many places still allow the ungrounded conductor to be connected to the shells of sockets? Is electricity any less deadly or more fireproof in some places where ignorance and indifference rather than a common-sense progressiveness may be in control?"

The establishment of a quasi-court for national code interpretation was recommended by F. E. Cabot, secretary, Boston Board of Fire Underwriters. R. M. Hudson, of the Department of Commerce, Washington, outlined the economic benefits of simplification and called attention to the need of greater standardization of attachment plugs. He favored uniform wiring regulations.

C. A. Bates, electrical engineer, Bryant Electrical Company, Bridgeport, spoke on the value of a single wiring code from the manufacturer's standpoint and A. R. Small, vice president, Underwriters' Laboratories, New York City, told of the importance of an adequate factor of safety in wiring code applications.

At this meeting the old Western New England Association of Electrical Inspectors was disbanded and the new organization, under the name of Eastern Association of Electrical Inspectors, was formed. Officers were elected as follows: President, Thomas H. Day, Hartford; vice president, W. C. Field, Springfield, Mass.; secretary pro tem, M. E. J. Balf, Hartford; treasurer, Allen W. Hopkins, Springfield.

Manual on Kitchen Lighting Campaigns

The Society for Electrical Development reports the completion of a 46-page manual on kitchen lighting campaigns.

This manual has been based on studies covering all important campaigns, beginning at the very inception of the movement. Many troublesome questions are dealt with at length, and satisfactorily answered, and it is believed that those who purpose conducting kitchen lighting campaigns will secure many valuable points from the manual.

Copies of the manual can be obtained from the S. E. D.

Buffalo Electric Show—First in Six Years

Since the first Buffalo electric show of 1914, electricity has made astounding progress; some of the evidences of this progress were publicly demonstrated in the show held in 1919 and many more are to be presented in the show to be held this spring.

The 1925 show will be held April 23rd to May 2nd in the Elmwood Music Hall, Buffalo, under the auspices of the Electrical League of the Niagara Frontier.

The exposition is to be made the occasion of educating the public to a better understanding of the importance of electricity and there are to be many special features which will well justify the attendance of electrical men from other cities at this exposition.

The officers are as follows: Ed. D. McCarthy, general chairman; W. E. Robertson, vice chairman; William R. Huntley, treasurer; Harry S. Hilliker, secretary.

Denver Planning Electric Show

Plans for giving an electric show under the sponsorship of the Electrical Cooperative League of Denver are still under discussion and a report of the special show committee was presented to a meeting of the executive board of the league on March 4. In its report the committee submitted a budgetary cost of $15,000. If the exposition is given there will be space in it for 22 major exhibits and for an additional 48 minor exhibits.

North Carolina Legislature Defers Action on Licensing Bill

The bill for the examination and registration of electrical contractors in North Carolina, proposed by the electrical contractors' and dealers' organization of that state, was held up by the legislature at its recent session and action on it has been postponed indefinitely. This has been considerably disappointing to the association, according to N. L. Walker, president, since the members had worked hard on the preparation of the bill and had urged its passage strongly upon the legislators. Many telegrams were sent state representatives and senators asking that they support the bill and explaining the need of such a law.

A similar bill had been presented first by the insurance department of the state. This was killed and then the contractors got together and with the help of inspection interests, wrote and presented another bill. The House Committee turned it down at a first meeting but later some members of the Committee, not present at the previous meeting, said they were interested in its passage and asked that it be presented to the Senate Committee for consideration. Members of this Committee thought there was merit in the bill, but time was short and failure to present the bill to that session of the legislature has postponed action on it indefinitely.

Rhode Islanders Hear Co-Operative Advertising Urged

About 90 men were present at the February meeting of the Rhode Island Electrical League, held at Providence, Feb. 26. Frank G. Thurston, past president, opened the meeting after which he introduced the newly elected president, Roger A. Gordon, sales manager, Blackstone Valley Gas and Electric Company, who announced that the executive committee had elected A. H. Allcott, manager of the Electric Shops of the Narragansett Electric Lighting Company, vice president; Ralph H. Huse, member of the firm of W. A. Huse & Son, treasurer; and Harry E. Dawson, secretary. A. H. Allcott is chairman of the program committee for the coming year, E. J. Wood of the membership committee, F. G. Thurston of the code committee and Morton Taylor of the finance committee.

The first speaker of the evening was Harry B. Kirkland of the Society for Electrical Development who talked about the Red Seal campaign.

A. H. Allcott, speaking for the program committee reviewed the educational work done through the year such as radio talks, the blue print campaign for better wiring and stated that this type of work would be continued. The red seal idea will probably go into effect shortly. A newspaper campaign of advertising has been planned for three months with the expectation that it will be continued after that period. During this campaign copies of the advertisement will be mounted on cards and supplied to the contractors and dealers having stores for display in the show windows.

The principal speaker of the evening was D. Gus Schneider, of the Schneider Advertising Agency, Providence. He stated that the central stations sell 40 per cent of the small electric appliances, the contractors and dealers, 30 per cent, and all the other stores handling such appliances the remaining 30 per cent. With the contractors and dealers doing all the wiring and selling 30 per cent of the appliances he asserted this group was a very important division of the industry.

He advocated more co-operative advertising, continuous advertising and the use of the largest possible space, stating that by grouping all electrical advertising together around the co-operative advertisements it was possible to secure the advantages of large space without any individual spending larger sums of money than he would afford.

He advocated very strongly telling the people more about wiring, the need of convenience outlets and teaching the people to look to the contractor for advice about electric wiring. He stated that the average architect and builder do not allow nearly enough for the electrical equipment and that if people knew more about what constituted a satisfactory wiring job, more money could be made on new houses and not so much time would have to be devoted to finishing up jobs that have already been done. He said when we go to the tailor we expect a suit that will fit, and no tailor of high standing spends his time doing patch work. The electrical contractor should follow the example of the tailor and insist on every job of new house wiring being one that will fit the needs of the house owner so it will not be necessary to begin doing patch work shortly after the house is occupied or suffer a great deal of inconvenience due to an incomplete job having been done. The solution he stated was advertising to the people and teaching them the importance of first class work and a complete job at the very start.

Canada to be N. F. P. A. Electrical Field Secretary

Arrangements have been completed with W. J. Canada to act as Electrical Field Secretary of the National Fire Protection Association. Mr. Canada will act under a regular committee of the N. F. P. A. to be called the Committee on Electrical Field Service, comprised of representatives of the member organizations joining in support of this activity. These organizations are: The Association of Electragists, International; the Electrical Manufacturers Council; the Electrical Supply Jobbers Association; the National Board of Fire Underwriters; the National Electric Light Association and the Underwriters' Laboratories.

It will be Mr. Canada's especial function to further the co-relation of all efforts towards unification of electrical practice, particularly through the medium of more widespread recognition and understanding of the National Electrical Code as an American Standard.

Since it is in the actual concrete application of standards in the field that influences for divergence from standards of practice make themselves felt, the work of the Field Secretary will be more particularly directed toward co-operation with Code administrators and appliers in ascertaining instances of divergence and appraising their importance, the pressure for them, and the degree of waste and confusion they impose on the public. He will thus ascertain which existing or proposed variations clearly have a balance in their favor and can be brought into consideration for orderly revisions of standards as constituting a warranted judgment or experience in the field. It is expected that the Field Secretary will be able to assist in securing mature consideration of proposed divergencies from standards and in many instances assist in defering such divergencies until, if justified, they may become a part of Code revisions.

Mr. Canada's earlier work has been mostly of a similar co-operative engineering character and embraces electrical plant construction and operation, electrical inspection and engineering for fire underwriters and municipal authorities, safety engineering and the formulation of safety codes for the Federal Government and general engineering studies of plant operation for electrical utilities. Mr. Canada relinquishes charge of the engineering department of the National Electric Light Association to undertake this new co-operative activity beginning May 1st.

Nominations for St. Louis Electrical Board of Trade

At a recent meeting of the nominating committee of the St. Louis Electrical Board of trade the following list of nominees was selected to be voted on at the annual election in June.

For president, W. A. Layman, Wagner Electric Corporation; for second vice president, C. E. Allen, Westinghouse Electric & Manufacturing Company; for treasurer, Frederic A. Kehl, the Brilliant Company; for executive committeemen, C. H. Chapline, representing the contractors' section; L. D. Moore, representing the railroad section; Colin B. Kennedy, representing the telephone and telegraph section; Ralf Toensfeldt, representing the engineers' section; W. L. Upson representing the research laboratory section.

N. E. L. A. Sponsors Industrial Lighting Campaign

In an effort to better industrial lighting conditions throughout the country, an industrial lighting committee is being formed in the commercial section of the National Electric Light Association to conduct a nation-wide campaign in the principal industrial cities. The committee will be composed of representatives of all branches of the electrical industry interested in industrial lighting and, in addition, representatives from other industries that have an interest in better and safe production in manufacturing plants.

This was disclosed at a meeting of forty-seven representatives of central stations, manufacturers and national organizations, called by Joseph F. Becker of the United Electric Light & Power Company and chairman of the industrial lighting committee of the National Electric Light Association at the N. E. L. A. Headquarters on March 17th, to discuss the plans of this Committee for carrying out an industrial lighting activity next fall.

A complete plan for carrying the message of better lighting to the industrial plants in the United States was presented and practically all of the central station commercial men represented in the meeting expressed themselves as being favorable to this plan. According to representatives at the meeting, Cleveland, Boston, Philadelphia, San Francisco and smaller communities controlled by syndicate companies will participate in the activity.

Mr. Becker explained the entire activity to those in attendance. Advertising and demonstration and lecture activities were explained by J. M. Hickerson and S. G. Hibben, who are respectively the chairmen of these committees. This provides a complete plan for national organization and the organization of local groups to interest industrial plants in bettering their factory lighting. A committee of from twenty-five to thirty will be appointed by Mr. Becker to carry out the program and an Executive Committee consisting of J. F. Becker, chairman; George M. Moore, treasurer; L. H. Rosenberg, secretary, and five other men, will direct the activity.

A plan book will be distributed which will outline the complete campaign and show the local communities how they can participate in the activity to sell more factory lighting and increase the load of the central station. Expenses of the national advertising and organization work will be borne by manufacturers of reflectors, lamps, etc., and the costs of the local work will be borne by the local group, such as the electric league.

It is possible that prizes of some character will be given to the communities doing the best work in connection with the campaign, although it was felt that such an incentive was not needed as considerable profits will accrue from the activity in the local community. Those in attendance, which included the Lighting Committee of the N. E. L. A., were told by Mr. Becker that further information would be given to them concerning the activity and that he counted upon their support in making the campaign a success.

Mr. Becker stated after the meeting to a representative of THE ELECTRAGIST that the contractor would be a very important factor in this campaign. He said that while the central station would take care of the selling end of the campaign it would certainly be up to the contractor to make the installations after they were sold. Just how the contractor will be able to tie in with the central station in the campaign, he stated, can be worked out by the local leagues which will have local control.

The committee will conduct an advertising campaign in national, business and industrial magazines in order to interest executives of plants in better industrial lighting and will assist local

A Fish Story

By this time the participants in an expedition that Izaak Walton would have envied are back on their jobs, and telling luncheon companions how long the fish they caught were and how much longer were the fish that got away. If anybody doubts the first part of their story, they have the photograph above to vouch for their veracity. The picture was taken after the return of the fishing party that hooked these trophies in Florida waters. The anglers in the photo are C. J. Briner of the firm of C. J. & F. E. Briner, electrical motor repairs and sales, St. Louis; Frank Adam; William Wurdack, of the William Wurdack Electrical Manufacturing Company, St. Louis; and Fred Adam, who needs no introduction to the industry. The collection of piscatorial prizes includes a seven-foot sailfish, caught by Mr. Wurdack, a six-footer of the same variety, hooked by Mr. Briner, and a number of sharks, mackeral and barracuda.

groups in the industrial cities in stimulating the use of better industrial lighting.

Committee chairmen will be appointed in each of the twelve geographical divisions of the National Electric Light Association, who will carry the story of the activity to the cities and show them how they can obtain the interest of manufacturing executives in the lighting problem.

In addition to the advertising campaign, the committee will prepare direct mail material for the use of the local groups, provide a lecture and demonstration service and send men into the field to assist in the solving of local problems.

The direct mail material will consist of several broadsides which can be mailed to the prospect list of the local group, inviting the recipients to visit demonstrations on the effect of better industrial lighting, or to request the services of an engineer to discuss the problem of better lighting in factories.

In addition, the local group will be provided with suggestions for newspaper advertising to back up the advertising of the committee and the direct mail literature.

Suggestions for demonstrating the proper kind and types of equipment for factory lighting at a central exhibition and for laying out model factories will be provided by the committee for the local groups. Also, the local groups will receive suggestions from the national committee for planning actual specifications for re-lighting industrial plants.

The local group will consist of an already existing electrical league or the local electrical people can form a committee to carry out the plans.

The campaign will be conducted next fall and while the definite details of the activity have not been completed, it is expected that they will be so broad that any city can participate for the general good of the industry in the town and actually obtain increased business in industrial lighting equipment.

San Francisco Inaugurates Kenney

C. B. Kenney, popular California electragist, was inaugurated as president of the San Francisco Electrical Development League at a meeting held March 2. The meeting took place in the ball room of the Palace Hotel. An elaborate program was put on and the entire proceedings were broadcasted over KGO, the General Electric radio station at Oakland.

The electragists turned out in goodly numbers and presented Mr. Kenney, known to his friends as "Cap," with a twenty pound cast steel gavel and a three foot bottle of champagne which spouted four or five feet up in the air when the cork was removed. A number of 22-in. by 28-in. electragist job signs, reading "Electrical Work by Cap Kenney" were put up around the room.

Albert H. Elliot was chairman of the program and at the speakers' table, in addition to Charles Hutchinson, retiring president, and Mr. Kenney, there were the following past presidents of the league: R. M. Alvord, Robert Sibley, R. E. Fisher, Garnett Young, Louis F. Leurey, R. A. Balzari, Henry Bostwick, E. O. Shreve and C. L. Chamblin.

A report of the secretary, presented at this meeting, stated that 47 meetings had been held during the past year, with an average attendance of 200 at each.

The new president announced that the various committee chairmen and the personnel of the committees would be announced at the next meeting.

New Louisville Ordinance Effective

The new Louisville electrical ordinance went into effect on February 1 and licenses have been issued to around ninety electrical contractors. While the City through its inspection department has been on an All-Metal basis for some time it remained for the new ordinance to give it legal standing. The new ordinance also requires oil switches on everything above 500 amperes.

New Orleans Contractors Hear Accounting Talk

A meeting of New Orleans contractors and dealers, held March 5, listened to a talk on the vital need of proper accounting in the contracting business given by Arthur P. Peterson, field representative of the A. E. I. The speaker said the reason for the majority of ridiculous bids on electrical construction work is ignorance of the actual costs involved. He recommended the use of the A. E. I. Standard Accounting System in conjunction with the Manual of Estimating so that the contractor would know not only his labor and material costs but his overhead as well.

News Notes Concerning Electrical Contractor-Dealers

The name of the electrical contracting business conducted by Charles Jacobson at 1819 Broadway, New York City, will be changed to Gotham Electrical Contracting Company. There is no change in ownership.

Jacob A. Busch, electrical contractor, has moved to new and larger quarters at 1817 Callowhill Street, Philadelphia, Pa., at which address he would like to receive latest catalogues and list prices. He has announced that he is in a position to represent several electrical lines in that district.

Formal opening of the City Electric Company's new store at 1151 Broadway, Tacoma, Wash., took place during February. The company, which is owned and operated by M. R. and J. J. O'Keefe, was formerly located at 311 South 11th Street.

The firm of Foster & Masters has opened an electrical shop in Oak Park, Cal.

The Bolen Electric Company has been organized in Ely, Nev., with Arthur L. Bolen, president; N. J. Thomsen, vice president; and E. E. Lozier, secretary and treasurer.

James Welker and Alfred Taylor, operating in Sharon, Pa., as the Taylor & Welker Electric Company, have dissolved partnership. The business will be continued under the management of Mr. Welker.

A new electric shop has been opened in Sebring, O., by Mr. and Mrs. S. E. McKee. Mr. McKee had charge of the first electric shop in that community and has been in the business for twenty-five years.

The Allen-Pursel Electric Company has established a store at 1225 North Vine Street, Hollywood, Cal.

The Kerner Electrical Supply Company has leased a location for a store at Belington, W. Va.

Raymond F. and Paul J. Laux have opened an electrical store at Wilkes-Barre, Pa.

•MANUFACTURING•

A Department Devoted to the Latest Devices Used by the Electrical Contractor and Dealer

Fixture

The F. W. Wakefield Brass Company, Vermilion, O., manufacturer of "Red Spot" hangers and other lighting specialties, announces a type of fixture which attaches to any ceiling fan and gives safe and rigid support to lamp

and globe. The unit consists of a substantial brass shell which bolts securely to the motor frame of the fan. Safety of the glassware is insured by bevel pointed holder screws, which are prevented by the weight of the glassware from loosening by vibration.

Motor Lubrication

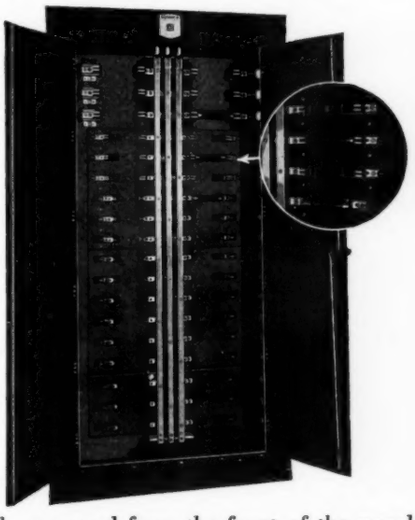
A new type of motor lubrication for fractional h. p. motors has been developed by the Century Electric Company, St. Louis, Mo. This consists of a packing around the bearing, composed of a number of continuous strands of pure wool yarn. The continuity of the strands permits capillary action to assert itself completely and also assures complete filtration of all oil through the yarn fibre before delivery to the bearing surface. The yarn will hold in suspension sufficient oil to lubricate a fractional h. p. motor for one year's continuous running.

Convertible Power Panel

The Square D Company, Detroit, Mich., has announced a new power panel construction embodying several new features in panel board design.

Individual insulating bases set into slots in a steel grid make it possible to adjust, at any time, fuse jaw spacings to provide for either 30, 60, or 100 amp. fuses. This adjustment can be made by merely loosening several nuts in the steel grid, moving the bases to the desired distances and tightening up the nuts again. The entire job can be accomplished in several minutes.

Fuse jaws, connectors and solder lugs are mounted on the individual insulating bases in such a way that they can



be removed from the front of the panel in a few minutes time by means of a screw driver. This is designed to save considerable time in replacing burned fuse jaws.

The construction is such that three wire circuits can quickly and easily be converted into two wire and vice versa.

It is unnecessary to remove the heavy doors and side trims to make the circuit wires accessible. A split gutter wall, half of which is made removable by loosening several screws, makes it easy to have access to the circuit wires.

Convertible power panels are available in circuits of four or multiples of four. The fuse spacings will take care of 30, 60, or 100 amp. Panels are supplied for 220, 440, or 600 volts.

Cartridge Fuses

Announcement was made recently by the Trico Fuse Manufacturing Company, Milwaukee, Wis., of a new line of approved non-renewable cartridge fuses. The new line, which is built in all standard sizes to 600 amp. and approved in both the 250 and 600 voltages, is known as the Trico "Kantark" non-renewable fuse.

Limit Switch and Motors

A new limit switch has been designed by the General Electric Company for window-opening service, which also has a wide field of applications where such a device of small size of the geared type is required. The switch operates on the traveling nut principle, opening a circuit in either direction of travel, the distance of travel being regulated by means of an adjusting screw permitting calibration of from two to twelve turns.

Toaster

A "flopper" Toaster is the first of a series of new additions to the "Liberty" line of electrical appliances, made by the Liberty Gauge & Instrument Company, Cleveland.

The new toaster is made of 20-gauge cold rolled steel, heavily nickeled, and polished and is equipped with a Nichrome heating element, suspended vertically between two refractory supports to insure even heat distribution and maximum life.

It has no springs or moving parts to get out of order. The bread is removed from bread rack by pressing bread in at the bottom and reversed with one hand. The bread racks measuring 5x5½ inches, accommodate two extra large slices of bread which may be cut to any desired thickness.

The new unit is equipped with coaster feet, six feet of extension cord and a standard two piece separable plug.

Lighting Shade Holder

A new lighting shade holder is being made by the Beardslee Chandelier Manufacturing Company under the catalog number "S7." In this new holder the porcelain socket is fastened in place with two screws through the shell into the cast loop and thus cannot turn or twist. This prevents short circuits caused by bruising the insulation of the wire. The cast loop has a projection that extends through the shell or holder, providing a substantial and smooth bushing

for the passage of the wire. The chain loop being attached to the holder by two screws distributes the weight of the holder and glassware, supporting the globe plumb and level. The wire way is large and the device is wired with No. 14, heat-resisting insulation wire. The screws holding the glass are large with knurled heads passing through bushings that are both riveted and soldered into the holder. Oxidized bronze is the standard finish used and the holder comes in 4, 5 and 8-in. sizes.

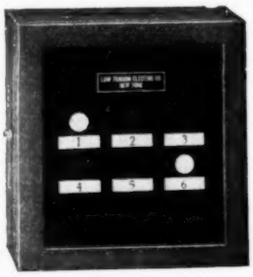
Centrifugal Circulating Pump

The Palmer Electric Company, 1258 Park Place, Detroit, Mich., has placed on the market a small centrifugal circulating pump, the feature of which is that the pump is built as an integral part of the motor. In this way the device eliminates sub-base, coupling, bearings and thrust collars in pump proper. There is but one stuffing gland and one moving part.

All gaskets but one are eliminated and there are only four bolts and one set screw. This, the company states, provides considerably less chance for noise and reduces weight considerably.

Annunciator

The Low Tension Electric Company, 35 Ann Street, New York City, is manufacturing an electrical reset annunciator suitable for use on transformer or battery. The drops used are of simple but rugged construction, operating on electro-magnetic principles. They have no locks, contacts or other parts which can



get out of adjustment, yet are so built that the indications remain in the set or reset positions after the current has been released. In resetting nothing moves but the drops which are to be reset. This eliminates any buzzing sound in resetting. These annunciators are made in wood or metal suitable for wall or desk mounting.

Canopy Switch

A new pull chain canopy switch, "P. & S. 3316," has been placed on the market by Pass & Seymour, Inc., Solvay Station, Syracuse, N. Y. It has an easy action preventing strain on the canopies and permits a smooth pull from any

direction. The rating of the switch is 3 A., 125 V., or 1 A, 250 V., and it is built for a severe overload. This switch is designed with 5-16 inch stem and lock nut which will fit the 1-8 inch pipe size punch, short chain and six foot cord. The switch can be installed in ceiling canopies, pan fixtures, outlet boxes and home lighting units where individual control at the unit is desired or where a a wall switch is impractical. Brush brass is the standard finish of exposed parts. Extra outlet box fitters may be supplied with each switch without extra charge.

Combination Hanger and Box

The Peerless Electro Products Company, Baltimore, is marketing a "new work" combination consisting of its type C hanger and its box No. 404. The combination is complete and is listed in its catalogue as No. 406-C. The box, galvanized finish, is 3 1-4 inch in diameter by 1-2 inch deep and comes equipped with extra strong double clamps for either loom or flexible armored conductor. The bushed outlet holes of the guide take the place of old style flexible armored conductor bushings. This feature eliminates the need for other clamps or bushing to work in either the loom or the flexible armored conductor.

Condensed Notes of Interest to the Trade

The Holophane Glass Company, 342 Madison Avenue, New York City, has issued a new edition of its "Datalog." The publication is a combination catalog and lighting data book.

The F. W. Wakefield Brass Company, Vermilion, O., lighting specialty manufacturer, has issued a new series of condensed data sheets on its entire line, superseding all previous catalogue publications of this company. It has also published a pamphlet, Bulletin No. 318, which is a non-technical treatment of "Better Lighting of Business Buildings."

A new catalogue has been issued by the Union Metal Manufacturing Company, Canton, O., showing its line of exterior lighting fixtures.

The Square D Company, Detroit, Mich., has just purchased an addition to its main plant which enlarges its floor space by twenty-five percent. According to the company's announcement, increasing business made it necessary to increase production facilities.

The Crosley Radio Corporation has appointed Walter B. Fulghum as general sales manager. He was formerly with the Victor Talking Machine Company.

A sales conference, attended by a number of its district sales managers and department heads, was held by the American Wiremold Company in Hartford, Conn., March 3 to 6.

William T. Clark has been added to the engineering staff of the Trico Fuse Manufacturing Company, Milwaukee, Wis.